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ORIGINAL ARTICLES.

A CASE OF ENTERIC FEVER COMPLICATED BY POLYURIA.[1]

BY J. C. WILSON, M.D.,

OF PHILADELPHIA.

THE moderate polyuria which often attends the period of defervescense and early convalescence in the acute febrile infections is too well known to excite comment, and the literature abounds in instances of glycosuria as a complication of these diseases. But transient non-saccharine polyuria at one time exceeding, as in the following case 6,000 c.c. in twenty-four hours, developing in the course of an attack of enteric fever and subsiding with the decline of the temperature, must be very rare. I have never before had the opportunity of observing such a case, and such examinations of the literature as I have had made fail to discover analogous cases. Very recently, I learn that my friend, Dr. Fussell, has observed a similar case, which he will report on this occasion. For nosological purposes it would be well if the distinction between polyuria as a symptomatic and transient condition and diabetes insipidus as a substantive affection, a distinction corresponding to that between glycosuria and diabetes mellitus, were more generally observed.

Enteric fever with prolonged and peculiar delirium in a male adult, complicated by massive polyuria developing in the mid-course of the attack and subsiding with the fall of the temperature. Treatment, systematic cold bathing. (Notes by Dr. Kalteyer.)

REPORT OF CASE.

J. W. V., aged twenty-nine years, single; birth place, Michigan; occupation physician. Admitted to the medical ward of the Jefferson Hospital September 25, 1902.

Diagnosis.—Enteric fever, complicated with polyuria.

Family History.—Father, mother, two brothers and one sister living and in good health. There is no history of neuropathic, cardiac, or tuberculous disease in the family. The patient's mother suffered from cancer of the breast, which three years ago was successfully removed by operation and has shown no signs of recurrence.

Previous Personal History.—The patient was informed that he had measles and chickenpox in early childhood. At the age of six years he suffered from diphtheria. Some years ago, he had an attack of catarrhal jaundice which lasted for about ten days. At twenty-six years, he suffered from an acute illness of about a week's duration, which was said to be acute appendicitis, the principle symptoms of which were colicky abdominal pains, at first general and later localizing itself in the right lower abdominal quadrant; vomiting and fever. He made an uneventful recovery without operation, and so far has not had a relapse. After this illness he enjoyed good health until the present illness. He has never suffered from Neisser's disease or syphilis; he has used alcohol moderately and smoked occasionally.

History of Present Illness.—Four days prior to his admission into the Jefferson Medical College Hospital, he complained of loss of appetite, malaise, and severe frontal headache. The patient states definitely that previous to September 21 (four days before entrance into the hospital) he appeared to be in excellent health; his duties, which consisted of an obstetrical practice in Philadelphia, made great demands upon his time. During the past summer he was in the habit of drinking unfiltered and unboiled water. On Monday morning, September 22, his condition had somewhat improved; he had slight browache, although soreness in the muscles of his limbs was a prominent symptom and his appetite remained impaired. On Monday evening his temperature registered 99²/₅° F., headache grew worse, and becoming somewhat anxious about his condition, he took 1½ grains of calomel in divided doses. On Tuesday morning he had a loose bowel movement; his temperature registered 99° F., headache was now constant and distressing, and weakness pronounced. In the evening his temperature registered 101²/₅° F. On Wednesday morning, the temperature was 101° F., his condition was decidedly worse, and in the evening the temperature rose to 103° F., during the course of the day the symptoms previously mentioned intensified. He took to his bed on Thursday morning, when he was admitted to the hospital.

Condition on Admission.—Temperature 101.2° F. (axillary); pulse rate, 90; despiratory rate, 20; cheeks flushed; pupils dilated, and the tongue coated lightly on its dorsum with a whitish fur. The abdomen was somewhat tympanitic, the spleen could not be palpated, but on percussion evidence of enlargement was noted. The heart and lungs appeared normal.

Blood examination revealed the following:

Erythrocytes	4,580,000 per cubic millimeter
Leucocytes	8,600 per cubic millimeter
Hemoglobin	80 per cent.
Color index	.88

The blood gave a positive agglutination reaction with the *Bacillus typhosus.*

The urine did not give Ehrlich's diazo reaction.

On September 27, two days after admission,

[1] Read by title at the meeting of the Association of American Physicians, May, 1904.

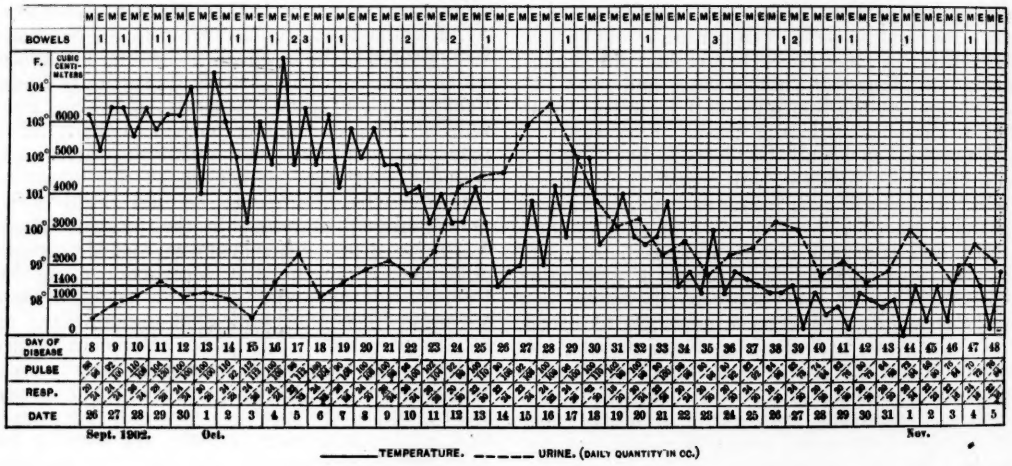
a single rose spot which disappeared on pressure and reappeared when pressure was released, was discovered in the epigastric region.

The treatment ordered on admission was as follows: Liquid diet—milk, broths, etc., at three hour intervals; one grain of calomel in divided doses. Sponging with water having a temperature of 60° F. when his axillary temperature rose as high as 102° F., and tubbing in water at 70° F., when his temperature registered 103° F. or higher, every three hours. During the plunge a half a dram of aromatic spirits of ammonia was administered. At intervals of six hours a Leiter's coil was applied over the heart through which hot water was passed for about a minute and then cold water for about twenty minutes. On October 1, when Prof. Wilson took charge of the service, the treatment was modified. The diet was unchanged, but other measures were discontinued, and bathing in water having a temperature of 70° F. was ordered every third hour when the temperature in the axilla registered 101.5° F. The patient was given one-half ounce of whisky during and after the plunge.

The disease seemed to run a typical course except that delirium of a low wandering type later becoming very active, manifested itself early and was quite constant, abating only after the plunges, when, as a rule, the mind remained clear for a short time. Crops of rose spots were observed from time to time.

The lower edge of the spleen was palpable during the second week. The pupils remained dilated; the tongue became very dry, and its coating was thick and brown. He often complained of dryness of the mouth. Constipation prevailed during the entire course of the illness, being especially pronounced in convalescence. Enemata were given at regular intervals. Emaciation set in rapidly. The quantity of urine began to increase on October 5, and urination became frequent. The highest amount voided was 215 ounces on October 16. The patient suffered from an unquenchable thirst. He was constantly craving water which was given to him in liberal amounts. The delirium became more severe during the third week, when a peculiar wandering of mind was present. He frequently complained of thirst, and became difficult to manage.

His mental agitation was accompanied by considerable restlessness. As a rule, the delirium conformed to an active type and the patient often engaged in conversation with those about him. He was in the habit of discussing various medical topics incoherently, and his thoughts seemed to dwell upon his condition. The mental derangement continued into convalescence and subsided very gradually. Subsidence of the polyuria was also gradual. On October 16, valerianate of zinc in one-grain doses and ergotine in three-grain doses were administered three times per day. After he had fully regained consciousness, he remarked that he recalled but few events of his illness except that his mind was often clear during and for a short time after the plunge.



Polyuria was a most conspicuous sign and while this was most marked, micturition was so frequent that is was necessary for the patient constantly to have a urinal either upon his bed or upon the table adjoining it.

The accompanying chart shows the daily variations in the amount of urine during the course of the illness:

Urine examination, September 27, 1902.—The quantity of urine for the twenty-four hours preceding was 30 ounces. Color, amber; transparency, clear; specific gravity, 1.018; reaction, acid; albumin, a faint trace present; sugar, not present; urea, 2.1 per cent.

Microscopical examination.—Amorphous urates, squamous epithelial cells, and a few granular casts were found.

Urine examination, October 8, 1902.—The quantity of urine for the twenty-four hours preceding was 55 ounces. Color, straw-colored; transparency, clear; specific gravity, 1.003; reaction, acid; albumin, a faint trace present; sugar, not present; urea, .7 per cent.

Microscopical examination.—Amorphous urates and squamous epithelial cells were found.

Urine examination, October 11, 1902.—The quantity of urine for the twenty-four hours preceding was 80 ounces. Color, straw-colored; transparency, clear; specific gravity, 1.004; reaction, acid; albumin, a faint trace present; sugar, not present; urea, .8 per cent.

Microscopical examination.—Amorphous urates and squamous epithelial cells were found.

Urine examination.—October 16, 1902.—The quantity of urine for the twenty-four hours preceding was 215 ounces. Color, straw-colored; transparency, clear; specific gravity, 1.005; reaction, acid; albumin, a faint trace present; sugar, not present; urea, .6 per cent.

Microscopical examination.—Amorphous urates and a few squamous epithlial cells were found.

Urine examination, October 18, 1902.—The quantity of urine for the twenty-four hours preceding was 130 ounces. Color, light straw color; transparency, clear; specific gravity, 1.001; reaction, faintly acid; albumin, a faint trace present; sugar, not present; urea, .3 per cent.

Microscopical examination.—Amorphous phosphates and a few pus cells were found.

Urine examination, November 17, 1902.—The quantity of urine for the twenty-four hours preceding was 40 ounces. Color, amber; transparency, clear; specific gravity, 1.015; reaction, acid; albumin, not present; sugar, not present; urea, 1 per cent.

Microscopical examination.—Amorphous urates, in a few epithelial cells, and a few pus cells were found.

The total amount of urea for periods of twenty-four hours, was increased at the height of the polyuria, and the accompanying chart illustrates the variation in the total amount.

Convalescence was uninterrupted and uneventful. The patient was given a soft diet after his temperature had remained normal for seven days.

He was discharged from the hospital on November 25, 1902, and has remained well until the last report about the close of the year 1903.

After the polyuria had reached an amount which excited our special interest, a daily record of the quantity of fluid ingested was kept. It is a matter of regret that this document, which properly forms part of the history of this case, has been mislaid. The polydipsia was as marked as the polyuria, and no restriction was placed upon the amount of water given the patient except that no single draught should exceed two ounces, it having been found that the craving recurred as quickly after larger quantities.

I have no hypothesis to offer as to the significance of the polyuria in this case. It was evidently the cause, not the effect of the great intake of fluid; the patient was neurotic and overworked but did not present the symptoms of any organic disease of the brain or nervous system. It cannot, in view of the enormous number of cases of enteric fever that have now been treated by systematic cold bathing, be ascribed to that measure, since many accurate studies of the urine have shown a very constant moderate increase but no such enormous output as in the foregoing case.

REPORT OF THE MEDICAL DIRECTOR OF ST. JOSEPH'S SANATORIUM TO THE ADVISORY BOARD.

BY E. S. BULLOCK, M.D.,
OF SILVER CITY, NEW MEXICO.

THE establishment of St. Joseph's Sanatorium was an attempt, the first, I think, to supply the need of a properly equipped, closed institution, for the treatment of tuberculous invalids in the Southwest. During my own often ill-advised wanderings over the arid region in search of health I was continually reminded of the necessity for such an institution, both by my own observations and from seeing the experiences of others. As time went on it became my ambition to provide such a sanatorium at some especially favored spot in the Southwest, to fill what seemed to me a crying need. An idea also took shape in my mind that the exact formulation of the value of climate in phthisiotherapy is of great importance to medical science. After six years daily work among consumptives out West I still lack the data which would determine the precise value of climate in the treatment of tuberculosis. A small number of cases is a very insecure basis for the derivation of scientific statistics, and for this reason I have not yet been able to see the truth clearly, much less to aid others to do so to any extent. Amid the conflicting opinions as to climate and its value (the positive statement of Dr. Flick that equally good results can be obtained in Philadelphia, and that no less certain opinion of Dr. Solly that climate is of prime usefulness), I decided that to bring order out of confusion would require extensive data from an institution located in the very center of a favored zone and complying with all the requirements of modern phthisiotherapy. I trust I have made clear the ideas which constitute the very foundation of St. Joseph's Sanatorium.

By meeting and knowing the Reverend Mother Paul of the Order of Sisters of Mercy, to whose clear-sighted intelligence St. Joseph's owes its existence, I was enabled to take the first steps in the realization of my ambition. We chose Silver City as the proper location of our prospective institution for the same reasons which actuated the army officials in selecting Fort Bayard as the site of the Government Sanatorium. They had an extensive experience in the Southwest, and were thus well aware of the fact that summer and winter, year in and year out, Grant County, New Mexico, provides the ideal in atmospheric environment. Glorious sunshine, maximum dryness, cloudless skies, warm winters, cool summers, an air so clear that on moonlit nights one can see the trees on the mountains twenty miles

away, these with little dust and comparative freedom from high winds, and all at the most favored altitude, 6,000 feet, make the sum of the climatic advantages of the mountainous portions of Grant County.

During the summer of 1901 I resigned my position as pathologist at Fort Bayard and came to Silver City, to aid in establishing the institution which forms the subject of this report. At Silver City the Sisters had a small building, with five suitable rooms opening upon a porch and available for patients. They had, however, plenty of ground and trees, which, as the institution developed, made a valuable feature. The small building mentioned, which is now used as an infirmary, was the nucleus of our present plant. In order to insure the perpetuation of our ideals it seemed important that the scientific management of the institution should be vested in an Advisory Board composed of men especially interested in tuberculosis. Such a Board was at once instituted, and has proved our most valuable asset; for its members have sent us most of the few patients we have had, and have always been ready to furnish opinions upon matters submitted to them. As at present constituted this Board consists of the following members: Drs. J. Solis-Cohen, Philadelphia; S. Solis-Cohen, Philadelphia; W. C. Glasgow, St. Louis; H. M. King, Liberty, N. Y.; Seymour Oppenheimer, New York; E. Fletcher Ingals, Chicago; E. L. Shurly, Detroit; S. E. Solly, Colorado Springs; J. N. Mackenzie, Baltimore; J. C. Wilson, Philadelphia; H. L. Loomis, New York; J. H. Musser, Philadelphia; J. R. Arneill, Denver; C. G. Jennings, Detroit; J. H. Burtenshaw, New York; J. B. Huber, New York; R. B. Preble, Chicago; Alfred Meyer, New York; A. R. Edwards, Chicago; Alfred Stengel, Philadelphia, and Hermann Chicago; E. F. Wells, Chicago; W. E. Casselberry, Chicago; R. W. Myles, New York; H. C. Wood, Jr., Philadelphia; Frank Billings, Chicago; Alfred Stengel, Philadelphia, and Hermann Biggs, New York.

It was the idea of those in immediate control of the institution that as soon as it became practicable the medical part of the work at St. Joseph's should be under the supervision of this Board, that its control in this respect should be actual rather than nominal and honorary. Today seems a most auspicious occasion for the carrying out of this idea; and I am here as the representative of the Sisters of Mercy to tell you about our work, to try and make you understand what we are doing out in the desert, and thus to realize one of our most cherished ambitions. It is our hope that you will form such an organization and elect such officers as will best serve this valuable scientific project. I am sure that I do not overstate the case when I dwell upon what such an institution in the Southwest means to medical science, and particularly to the unfortunate class sent West in search of health. Following the organization of the Board, the power to elect new members to it will be in the hands of its members.

It has always been our practice to send to the home physician a monthly report of the patient's progress. This, it seems to me, is a wise plan and one that should be continued, for it enables the physician sending the patient to follow the case and witness its termination, and also serves to maintain his interest in the work.

In order to provide suitable accommodations for patients it soon became necessary to erect additional buildings, and six months after the establishment of St. Joseph's, money was borrowed for this purpose and work commenced. The ambulant building, so-called from the fact that it accommodates patients without fever, is built around a court filled with trees. It is but one room thick, and without halls, which in our climate are unnecessary and would make dead air spaces unsuitable for ideal ventilation. It has a porch on both inner and outer sides, in all 600 feet long. Each room opens upon the porch from both sides. A building so constructed, with brick walls between the rooms, really forms a series of cottages, and has proved most convenient as regards the handling of patients and their personal comfort. In our region the atmosphere is rarely perfectly still, even at night, and careful investigation has proved to me that in these rooms the patient gets a constant supply of pure air. On this account we do not make any special feature of sleeping out of doors, though patients are permitted to do so if they so desire.

Each room is connected with the Sisters' dormitory by an electric bell. The rooms are heated by small stoves, though a fire is only required in winter when patients get up and again when they go to bed. The buildings are all lighted by electricity. A large recreation room with billiard table and other amusement features occupies one corner of the ambulant building. In the basement of this building, all above ground, are the executive offices, laboratory, and hot water heating apparatus. An adequate supply of bath and toilet rooms connect with a private sewer. The present debt of the institution was the cost of the ambulant building. Our present capacity is twenty-five patients, though as yet all the rooms have never been occupied at one time. We do not contemplate a much larger plant, for careful individualization of cases, so necessary to the highest success, is not compatible with a large number of patients. A few tent cottages, for the accommodation of patients desiring them, have been erected, though when a building constructed with every attention to ventilation can be obtained, I much prefer it to the less durable tent cottage. Patients without fever take their meals in a common dining room, and on account of the small number of women, a separate dining room is provided for them.

As far as possible and consistent with humanitarian action, hopeless cases are excluded. If

after sufficient observation I am convinced that nothing is to be gained by further treatment, I do not hesitate to advise a patient to go home, for this is not only just to the patient in question, but also to the others, as the depression which always follows a death in an institution where the patients are known to each other should be avoided if possible. From the beginning it has been the object of those in charge to make the cost of treatment as low as possible. On a basis of our present average of 15 patients $100 per month is the lowest rate compatible with meeting our obligations and the ordinary expenses of the institution. When a larger number of patients render it practicable we hope to reduce the cost. The rate of $100 per month includes everything required by the patient except clothing. It will be impossible to contemplate the establishment of a free department, which we have always had in mind, until we possess an endowment, and when the isolation of our location and the poverty of the Southwest are considered, it seems that the acquisition of such a fund must be a good way in the future.

As regards the features of daily life which contribute to cure, the discipline maintained in rigid. We have never hesitated, no matter how badly we needed the patient, to discharge anyone who, after due warning, refused to follow instructions. Patients are not permitted to leave the institution without the consent of the physician in charge. All sputum is placed in individual paper spit-cups, which are collected and burned as often as necessary. The rooms are wet-cleaned daily, and all bedding exposed to sun disinfection every day. Each room is carefully disinfected with formalin upon being vacated. Patients with constant slight fever, or those in whom the daily maximum temperature is over 100° F., are given actual cadaveric rest in the open air. Those with a normal temperature, or those in which the daily maximum temperature is above normal but less than 100° F., are given rest or moderate exercise as seems indicated. There is nothing I have come to fear more than too much exercise. Even in normal temperature cases, I am a firm believer in only sufficient exercise to maintain appetite and digestion.

Unless otherwise indicated, all patients are fed six times daily; three full plain meals and light feedings between meals and at bed-time, usually consisting of eggs, milk, bread, and butter. Each patient is visited every day, and those in the ambulant class report to the office of the Medical Director each morning for observation and treatment. Following the theory that disinfection of the air passages may prevent the infection of new areas, each patient is given every day an inhalation of a nebulized solution of trikresol and methylendiamine. All inflammatory processes of the respiratory organs receive careful attention. Sputum adherent to the larynx is washed away. Tuberculous complications of the accessible respiratory organs are treated twice daily. The principles which underlie all our therapeusis should be termed physiological, for by means of careful, persistent individualization, an attempt is made to maintain each and every organ at its highest efficiency. As I understand it this constitutes almost the whole of phthisiotherapy to-day. Once a month, or oftener if necessary, each patient receives a thorough examination, including sputum, blood, and urine.

Lack of space will not permit more than a passing reference to a few of the most interesting aspects of treatment. There are, however, some matters in this connection to which I desire to refer briefly: As long as progress towards health is uninterrupted it is my practice to treat patients upon strictly physiological lines, though always being ready to interfere if things go wrong; for instance, a reasonable time is allowed to pass after placing patients under proper conditions, and if the fever still persists, a series of sputum examinations is made to determine if the streptococcus is constantly present. If so, the patient receives streptolytic serum, which under such conditions had been of great assistance to me. Even if it does not cause a complete removal of febrility there is frequently an amelioration of fever as well as of other toxic symptoms. My experience has been that if the streptococcic infection can be removed the patient is much better able to handle the tuberculous and other infections, and often does so. There are times when the use of this serum seems a direct life-saving measure, converting an apparently hopelessly febrile case into an ordinary one. In continuously febrile cases, in which every means employed fails to lower the temperature, nothing remains but to send the patient home, for as I shall be able to indicate statistically later, climate, with everything else, must be admitted to be nearly a complete failure in this class of cases.

In very chronic cases with cavities and extensive fibrosis, in which the sputum is difficult to raise, the fluid extract of coccillana has often proved valuable. I have a number of such cases in which the patients state they could hardly dispense with it. Coccillana is best administered in a syrup in doses of fifteen to thirty drops every three or four hours. In hemorrhage, and especially chronic blood-spitting, we have a potent remedy in the chloride of calcium, which may be employed in much larger doses than are usually recommended. When given well diluted with water I have never seen it disturb digestion. Carbonate of guaiacol, carbonate of creosote, and benzosol, have a well-defined usefulness in the treatment of the associated infections of pulmonary tuberculosis. In pure tuberculosis in which there is a normal temperature I have never been able to convince myself that they are of any value. Their field is found in those febrile cases in which the streptolytic serum is either not indicated or is insufficient to remove all of the mixed infection. Benzosol and the carbonate of

guaiacol may be used for quite extended periods without disturbing digestion, and are, in fact, often beneficial in fermentative indigestion, especially that form associated with foul breath.

One of the hardest tasks presented to the phthisiotherapist is that of preventing undue loss of body proteids, and for this purpose ichthyol is second only to a proper dietary in aiding nutrition and arresting loss of weight. I have frequently tested its use by withdrawing it from a patient who was apparently thriving upon it, and immediately loss of weight would follow, to be checked only when ichthyol was again prescribed. Irrational as it may seem with our present knowledge of tuberculosis I am quite ready to say a good word for counter-irritation in the form of blisters applied over an active lesion. I have seen temperature drop a point or two coincident with their employment, especially if the bleb is carefully preserved and the serum permitted to resorb—a point I learned from my friend Dr. J. Solis Cohen.

In laryngeal tuberculosis, especially of the ulcerative type, I am convinced that frequent disinfection with formalin is a valuable procedure. In such cases, in those who can be taught to do it, I direct the patient to spray the larynx with formalin solution several times daily, and twice every day they report to me for careful mopping with the same solution. After all is said and done I am, however, convinced that in this class much more depends upon getting the patient into good condition than upon any local treatment. When the patient improves generally, improvement in the larynx usually follows, and per contra, in a steadily failing patient nothing but relief of pain is accomplished by laryngeal medication.

Anent the discussion of the place of climate in phthisiotheraphy, it seems worth while to mention some facts deducible from our experience. A case is often sent to us in which the patient before leaving home was having a daily chill, high fever, sweats, and profuse expectoration. Immediately upon his arrival in our climate these conditions are changed. The chills and sweats cease, fever comes down from two to three degrees, and the sputum is greatly diminished in quantity. Such an experience is much too frequent to be accidental, and too sudden to be accounted for by change in management, and if such a manifest amelioration occurs in otherwise hopeless cases, what must be the climatic influence in a more hopeful class? Though not so graphically presented it is probably none the less actual and positive. Among our patients sweats and chills, and diarrhea not due to tuberculosis of the intestine, are so rare that I can with difficulty recollect having prescribed for a patient presenting them. We have a number of patients with very chronic and extensive lesion, who occasionally come to us for advice and treatment. Should such go home for a visit they are always glad to return and again experience the resulting amelioration in symptoms which had developed and become annoying during the stay at sea-level.

An almost complete absence of pleurisy and pleuritic pain is evidently accounted for by the quiet sanatorium life. Hemorrhage is with us a very occasional manifestation of pulmonary tuberculosis. At St. Joseph's six months at a time have elapsed without the occurrence of a single hemorrhage. This is, of course, partly accounted for by the quiet life the patients lead, and yet some credit should undoubtedly be given to the diminution in atmospheric pressure which follows residence at a high altitude, an experience substantiated by experience with the pneumatic cabinet.

The apparent permanency of the different types of pulmonary tuberculosis is a characteristic worthy mention. For instance, cases in which the temperature does not drop below 100° F. within a reasonable time after admission—a month or two—remain permanently febrile. Cases afebrile upon admission, or those in which the temperature drops below the febrile point shortly after admission also exhibit the same marked permanency of type, as do the afebrile cases without bacilli in the sputum. This characteristic is often of great assistance in making a prognosis during acute exacerbations, for in chronic tuberculosis, with few exceptions, the future course of the disease will be like the past. As regards the length of time necessary to effect a cure, even in incipient cases, I have changed my ideas very much. It is, I am sure, much longer than we have been led to suppose. At St. Joseph's it is only seldom that I am privileged to witness a genuine cure. Human nature is such that even in cases in which progress toward health is constant and uninterrupted, patients will not remain under treatment longer than about six months. It is a fact that the more rapidly they improve the more difficult they are to control. Very great improvement is the rule at our institution, but cures require more time than patients will allot to it, even though money may not be a consideration. Lack of means is, of course, an insuperable obstacle to a long stay, though it occurs rather more infrequently than might be expected. As an offset to this tendency to break treatment after about so many months have elapsed, it is our practice to keep in close touch with our discharged patients in good standing, that is, those who leave the institution with our consent, and to maintain our connection with the case as long as the patient remains in the country. It is our desire that until ready to go home they should look to the institution for guidance and help in time of need. Occasionally it is my privilege to witness a truly wonderful struggle for life and health, very gratifying to one who so often sees the discouraging frequency with which patients will break their connection with a system which has proved so profitable to them. It is a fact that those having the hardest struggle make much the more creditable and persevering patients.

With the exception of an occasional cold we

have neved witnessed any intercurrent affection among our patients. This is, it strikes me, the highest possible tribute to the hygienic environment, climatic and otherwise. This absence of complicating diseases must be very advantageous to the pulmonary invalid. A most careful study of family histories seems to indicate that a distinct family predisposition to the disease is really a rare phenomenon, if it exists at all, and that favorable opportunity for infection plays the leading rôle in causation. A previous depreciated condition of the body due to acute illness, particularly other infectious diseases, seems to have a direct connection in many cases with infection with tuberculosis.

In regard to the presence of adventitious organisms in the sputum, I am quite sure that their number and the frequency of their occurrence depends very largely upon whether the sputum has been contaminated with mouth and throat organisms. The smaller the quantity of sputum and the more difficult it is to raise, as in incipient cases with few or no bacilli, the more constant is the occurrence of adventitious organisms. It thus follows that it is a great mistake to make a diagnosis of mixed infection from sputum findings alone. The clinical picture of sepsis must be, after all, the real criterion.

A diazo reaction in the urine is confined to hopeless cases as a rule, though occasionally present during acute exacerbations. The constant presence of this reaction is, of course, an indication of great disorganization of metabolism, though not at all necessary to an unfavorable prognosis, the clinical picture being amply sufficient for that purpose in such cases.

As regards the blood findings in tuberculosis, nothing except the presence or absence of anemia is of much importance clinically. Marked degenerative changes, like the diazo reaction, occur, as a rule, only in very unfavorable cases. If fever is present there is always a leucocytosis, which varies constantly with the degree of fever; therefore, to know the leucocytosis it is only necessary to be familiar with the temperature, except, of course, in miliary tuberculosis, in which leucocytosis does not occur. The presence of anemia is much more correctly indicated by the appearance of the patient than by any instrument so far devised. In very chronic cases especially, in which there is an anemia of quantity rather than of quality, so-called instruments of precision fail to indicate the condition. In this type of anemia I have not been able to see that the administration of iron accomplishes anything. If upon admission a patient presents a marked degree of anemia, as shown either clinically or by the hemoglobin scale, it is my practice to administer iron. If the degree of anemia is slight, I pay no attention to it unless it persists, which generally is not the case, the blood condition correcting itself, as a rule, within a short time. With us a count of the red cells is of very little value, for upon coming to a high altitude there is such a rush of immature red cells to the periphery that the erythrocyte count is very misleading. I have often seen a count of 7,000,000 to 10,000,000 red cells in a patient who presented unmistakable clinical signs of anemia. Mixed infection is almost always accompanied by anemia, and in such cases iron should be given from the start.

Under present conditions at St. Joseph's, it seems wrong to send us patients who cannot afford to remain under institutional care at least six months, and, if possible, able to stay a year if it seems necessary, if not all the time in the institution, at least under our direction. Our experience is that six months' institutional treatment usually suffices to place a patient on the safe side, so that with a little help now and then he may be trusted to look after himself, after spending the period mentioned under our immediate direction. In advanced cases especially, the patient should be warned that a great deal of time is necessary to accomplish a good result, and then when month after month passes and still a long period of invalidism is ahead, disappointment will not be so general nor so keen. It is very foolish, I am sure, to put a time limit upon tuberculosis, and when done often leads to such grave disappointment as seriously to handicap the patient in the struggle for health.

In examining the stastistics of any institution in the arid region it is important to keep in mind the fact that a large proportion of the cases belong to an advanced class, those in which the patient has been sent West only as a last resort. To my mind, the small percentage of incipient cases explains the comparatively great length of time treatment must be continued in order to get clinical cures, as well as their comparative rarity in institutional work out West.

One hundred patients have been admitted and discharged from the date of the establishment of St. Joseph's Sanatorium to the present time. Of these, 25 were discharged or died during the first month, and therefore will not be included in our statistics. They were all hopeless cases, and with the exception of those who died were all sent home as soon as possible. For the sake of perfect fairness five cases in which the bacillus could not be demonstrated have also been omitted, even though in all the patients made good recoveries. As we employ it, the term "clinical cure" means a normal general condition and temperature, freedom from signs of activity in the lesion, absence of bacilli in the sputum, and practical absence of cough and expectoration. Deducting the 25 cases under treatment less than a month, and the five in which the diagnosis could not be confirmed, leaves 70 cases to be considered in this report. In 12 or 17 per cent., a laryngeal lesion was present. In five of these or 42 per cent., the laryngeal lesion was cured. In three or 25 per cent., there was improvement, and in four or 33 per cent., we failed to control the laryngeal complication. Even though the number of our laryngeal cases has been very small the results

have been more than good. I have come to feel a certain sense of power in laryngeal tuberculosis, based upon results at Fort Bayard as well as at St. Joseph's Sanatorium, especially when there is absence of ulceration.

For the purpose of elucidating our results I have utilized both the old classification of three stages, and one of my own devising, and based upon the degree of mixed infection present, as indicated by the temperature, though, of course, not without a due sense of the deficiencies in our knowledge of the allied infections of tuberculosis. It, however, requires but little experience with pulmonary tuberculosis to recognize that prognosis depends very largely upon the degree of fever present, or what amounts to the same thing practically, the extent and gravity of the mixed infection. The size of the lesion and its character is of relative insignificance, and I have, therefore, also divided the cases into those with little or no mixed infection, and those with well-marked clinical mixed infection. Regardless of classification the general results are as follows: Three, or four per cent., died; 12, or 17 per cent., were unimproved; 38, or 54 per cent., were improved, and these, one should bear in mind, were nearly all potentially curable cases if treatment could have been continued long enough, and 17, or 24 per cent., were clinically cured.

In 25 cases there was infiltration alone, and of these one, or four per cent died; two, or eight per cent., were unimproved; 12, or 48 per cent., were improved, and 10, or 40 per cent. were clinically cured.

In 21 cases there was consolidation, and of these, one, or five per cent., died; one, or five per cent., were unimproved; 14, or 66 per cent., were improved, and five, or 24 per cent., were clinically cured.

In 24 cases cavities were present, and of these, one, or 4 per cent., died; nine, or 37 per cent., were unimproved; 13, or 54 per cent., were improved, and one, or four per cent was clinically cured.

It is thus plainly seen that the majority of our cases belong to the advanced and far advanced classes.

Fifty-seven cases were classed as pure tuberculosis, or minor degrees of mixed infection. Of these, one, or two per cent., died; five, or nine per cent., were unimproved; 36, or 63 per cent., were improved, and 15, or 26 per cent., were clinically cured.

Thirteen were cases of marked mixed infection, with an average daily maximum temperature of 100 or over. Of these, two, or 15 per cent., died; seven, or 54 per cent., were unimproved; three, or 23 per cent., were improved, and one, or eight per cent., were clinically cured. This exemplifies what I have tried to make clear in previous papers, that climate, like everything else, is practically powerless in severe mixed infection. It is yet too early to estimate the effect in this class of cases of a potent streptococcic serum, but that it will not be great I feel quite sure, for it must indeed be a wonderful serum that will meet the exceedingly varied infections of pulmonary tuberculosis.

In eight, or nine per cent. of our patients a complication occurred, such as a bronchopneumonia following hemorrhage, or an acute miliary tuberculosis, which either caused immediate death or ruined the prospect of cure. In the one case in which pneumothorax occurred, the patient, after two years, is still living. The total gain of weight in 70 patients was 1,035 pounds, an average of 14 pounds each. Three patients relapsed after apparent cure, though one of these subsequently recovered. Marked indiscretion accounts for these relapses, and the same is true of nine patients who relapsed after improvement. The cases were under observation an average of 7.6 months, and an average of 5.1 months in the institution.

One cannot, of course, form an opinion of the value of climate in phthisiotherapy from so short a series of cases as those described in this report, but based upon my experience at Fort Bayard and elsewhere, as well as at St. Joseph's, I have certain opinions on this subject, which, it seems to me, worth while to state. There is, of course, nothing actually specific in climatic treatment, but that there is something inhibitory to the progress of pulmonary tuberculosis in high, dry climates I do not for a moment doubt. Following the change from home conditions, climatic and otherwise, to an entirely new environment, there is such a stimulation of metabolism that the patient is often at once started upon the road to recovery. No one, I think, will care to maintain that it is not easier to practice phthisiotherapy under climatic conditions which permit us to keep patients out of doors all the year round in comfort, and that without any special provision for the purpose or urging of the patient. In high altitudes there is a relative immunity from hemorrhage, not altogether accounted for by the quiet life. An environment which from a hygienic viewpoint is ideal, eliminates to a marked extent the intercurrent affections which so often play havoc with the consumptive. The symptomatology is all modified for the better, as evidenced by lower temperatures, absence of night sweats, chills, and diarrhea. At the present time at least proper treatment in an ideal climate is the privilege of the comparatively well-to-do. A great injustice is done to poor people by sending them far from home. Nothing is to be expected from climatic treatment in cases presenting severe mixed infection, and it is always wrong to send the acutely ill upon a long journey. Certain cases, impossible to differentiate before-hand as a rule, are not adapted to high, dry, climates. Marked cyanosis and myocardial degenerations I consider the only well-established contra-indications.

To give climate in phthisiotherapy its proper place is the special mission of our institution, and how well we fulfil our purpose will depend largely

upon the support given us by the profession. St. Joseph's will never be entirely satisfactory, either to those in immediate charge, nor to the members of the Advisory Board, until the support given us is sufficient to render us entirely independent, especially of the whims or caprices of patients. We have managed to keep the institution open and do our work for nearly three years with the small number of patients stated above, and the struggle we have made and are still making in the interests of the consumptive and of medical science entitles us, it seems to me, to a hearty cooperation from the profession at large.

FEIGNED INSANITY: MALINGERY REVEALED BY THE USE OF ETHER.[1]

BY CHARLES G. WAGNER, M.D.,
OF BINGHAMTON, N. Y.;
SUPERINTENDENT OF THE BINGHAMTON STATE HOSPITAL.

ON the morning of January 14, 1902, William H. Ennis, thirty-two years of age, a police officer in the Borough of Brooklyn, city of New York, killed his wife, Mary A. Ennis, by shooting her with a revolver. He then went to a small hotel in the neighborhood, engaged a room, went to bed and was soon asleep. An hour or two later he was arrested and lodged in jail. He was indicted by the Grand Jury for murder in the first degree, was tried in May following, convicted of the crime as charged and sentenced to death during the week beginning July 7, 1902. His case was appealed but the sentence was affirmed and December 14, 1903, was finally designated as the date of execution.

During the trial it was shown that Ennis had been a police officer for eight or nine years; that he was a hard drinker and possessed a bad temper; that he was married in November, 1900, and had boarded with his wife's mother for about four years prior to his marriage; that after his marriage he frequently came home intoxicated and was abusive in language and conduct toward his wife who finally, with her three weeks old baby, left him about four months before the commission of the crime and obtained a legal separation. A large amount of expert medical testimony was offered by the defense in the attempt to show that the accused was suffering from paranoia; that he was delusional, epileptic and demented, and that he was unable to walk on account of lateral spinal sclerosis, all of which conditions were declared absolutely incurable. Other testimony by well-known experts was offered by the prosecution to show that the accused was feigning. In court Ennis was incoherent and answered questions irrelevantly or not at all. He appeared unable to walk without assistance or to stand erect with his feet squarely on the floor. At each step as he rested his weight to some extent on the ball of his foot, a violent coarse tremor agitated the entire leg. These abnormal mental and physical phenomena Ennis exhibited throughout his trial and after conviction, on the way to the state prison at Sing Sing, N. Y., where he was confined until his execution.

From the testimony of the prison physician at Sing Sing, the warden of the prison and the keepers who came in daily contact with Ennis, it appears that throughout the following eighteen months he manifested little if any interest in his surroundings or in outside matters; rarely asked questions and when spoken to usually replied incoherently or not at all. His expression and manner impressed the prison officials as indicating dementia or imbecility, although they were somewhat suspicious that he might be feigning.

During the entire period of his incarceration Ennis was never observed standing or walking without assistance; at all times he appeared to be unable to sustain his weight with his feet squarely on the floor, but when supported on each side he could walk or drag himself along on the balls of his feet, and while doing so his legs were invariably violently agitated by the coarse tremor previously referred to. As the time for execution approached the warden of the prison, being in doubt as to Ennis' mental condition, requested the Governor to appoint a commission to examine him. Governor Odell appointed as such commission Dr. George A. Smith, medical superintendent of the Manhattan State Hospital at Central Islip, N. Y., Dr. Daniel H. Arthur, medical superintendent of the Gowanda State Hospital at Gowanda, N. Y., and the writer.

On December 1, 1903, the commission met at the prison and after careful study of the records of the case examined Ennis. The prisoner was brought from his cell by two keepers to the office of Principal Keeper Connaughton. As he entered the office he was in great agitation. His legs, and to a less degree both arms, trembled violently. He appeared unable to walk, but apparently tried to put his feet forward step by step as the officers supported him into the room. Apparently when he bore but little weight on the balls of his feet the muscular tremor of his legs became so great that he would have fallen if he had not been supported. He appeared unable to straighten his legs so as to bring his heels to the floor. When seated in a chair the tremor subsided and his mental agitation became less pronounced. The expression of his countenance was idiotic or imbecile and he appeared not to know where he was or to realize the nature of the questions that were put to him. When asked his name he made no response until the question was repeated many times, and then only when spoken to sharply, he said, "Ennis." When asked his first name, after considerable delay he said, "William." After being asked many times how old he was, he said "thirty-five," which was not correct, his age being thirty-three years. No further answers could be drawn from him during the examina-

[1] Read at the annual meeting of the American Medico-Psychological Association, held at St. Louis, Mo., in June, 1904.

tion, but when asked if he had ever received any injury to his head, he nodded quickly in the affirmative and pointed to a spot on his head where an old scar was visible. When asked why he trembled he made no reply, but to the question "Are you afraid?" he immediately laughed and shook his head, as if desirous of conveying the idea that the tremor was due to disease and not to fear.

Ennis frequently laughed during the interview in an imbecile manner and almost continuously moved his lips as if whispering to himself, but no sound of speech could be heard. He continually looked about the room with a vacant stare. At the close of the examination, when removed from the office to his cell he dragged his feet in the same manner as when entering, and exhibited the same tremor of legs and arms.

On December 3, two days later, Dr. Smith, Dr. Arthur, and the writer again visited the prison and saw Ennis. He was brought into the office by two keepers. His countenance wore the same imbecile expression and his gait was unchanged, but when questioned he manifested slightly increased intelligence. He gave his name more promptly and when asked about the injury to his head, he immediately raised his hand to the vicinity of the scar and said "Doctors did that." When asked where he was, he replied, "In a hospital," and said that Doctors brought him there. He did not seem to realize that he was in prison, that he had committed a homicide, or that he had ever had a wife. His hearing was tested and found good. His pupils reacted promptly to light and distance. Reflexes were normal except the knee-jerk which was slightly increased. When shown different colored worsteds, he called red black and yellow red, but a few moments later when shown yellow again he appeared unable to say what color it was. When tested as to the taste he answered promptly and correctly when given sugar, but shook his head when asked to tell what salt, acetic acid, and bromide solutions tasted like. A variety of other tests were made and although Ennis showed somewhat more intelligence than on our first visit, he would not admit any knowledge of his crime. The examination lasted nearly two hours, after which Ennis was returned to his cell, two keepers supported him on his way to the elevator, and the same tremor of his legs was observed as when he was brought in. At this time the prison physician stated that, while visiting Ennis in his cell, he had asked him why he did not answer our questions, to which he replied that he did not know who we were and so he was not going to talk to us.

The results of our examination had thus far been to a considerable extent negative and, therefore, unsatisfactory. But owing to the contradictory character of the testimony at the trial and the irregularity of the alleged symptoms during his imprisonment, the commission were all of the opinion that Ennis was malingering, notwithstanding the absence of conclusive proof to sustain their convictions. It then occurred to the writer that an anesthetic might be of use in obtaining the desired evidence—the idea being that, if Ennis were malingering, the fact would become patent when all voluntary and purposeful action should be in abeyance. Accordingly, the commission met at the prison, December 8, for the third time. The prisoner was again examined. His expression of countenance, manner, gait and general appearance were unchanged. He was taken to the hospital operating room, placed upon the table and ether administered. He made no resistance and although his breathing was observed to be shallow he was soon apparently quite unconscious, but when taken from the table and with the assistance of two keepers made to walk he quickly revived and exhibited the same phenomena of gait, and the same expression of countenance as at the previous examinations.

In a few minutes he was again placed upon the table and ether administered until his muscular system appeared relaxed and consciousness was again apparently gone, but on being brought to his feet, although it was evident his mental faculties were somewhat clouded, his gait and countenance were unchanged. After a short delay Ennis was placed on the table for the third time. He made considerable resistance and declared he would not "take any more of that stuff," referring to the ether. Resistance was overcome and the ether administered until complete unconsciousness and thorough muscular relaxation were obtained. Just before this degree of anesthetization was reached Ennis became talkative, profane, and abusive; his voice was loud and strong, and his language coherent, forcible and expressive; whereas, previously he had talked but little and always in a low tone. While still profoundly unconscious he was lifted from the table and stood upon his feet. As consciousness began to return, with a little assistance he walked across the room without difficulty or muscular tremor, and at each step placed his foot squarely upon the floor. He walked out into the corridor to the elevator and on reaching the ground floor walked to his cell without assistance. The plea of lateral spinal sclerosis was thus disposed of.

The change in the character of Ennis' speech during anesthetization, his coherent, loud, profane language, which was evidently a near approach to his normal expression, and the elimination of the alleged spinal disease satisfied the commission that the pretense of insanity was without foundation and report was made to the Governor accordingly.

On the day following the last examination Ennis was visited by the prison physician, but he would not talk beyond saying that he was sick and wanted to sleep. The next morning, however, he was very communicative. When he

saw the prison physician approaching he immediately called out, "I had all you fellows guessing all right and you never would have caught me only for the ether." He said he had been "under an awful strain for a year and a half" and that he would "rather go to the chair than go through the same experience again." He talked freely about the murder and put the blame for the crime on his wife's mother. He talked intelligently about his whole life, admitted the crime and had no hope of escaping the electric chair. He said that no physician or lawyer had posted him on how to act or walk, but that one day while standing at his cell door, before his trial and after the alcohol was pretty well eliminated from his system, his legs trembled so much that he could not stand and keep them quiet. This trembling suggested the idea, and all that he had to do, he said, was to exaggerate the the shake somewhat and put on a "few fine touches."

The prison physician stated in a letter to the writer after the execution that Ennis proved to be quite a sensible fellow in his conversation, and that he went to the chair without showing any fear.

A NEW CASE OF CHLOROMA WITH LEUCEMIA, WITH A STUDY OF CASES REPORTED SINCE 1893.

BY GEORGE DOCK, M.D.,
AND
ALDRED SCOTT WARTHIN, M.D.,
OF ANN ARBOR, MICH.

INTRODUCTORY AND CLINICAL BY DR. DOCK.

IN 1893[1] I reported a case of chloroma with an analysis of the cases then known. Including my own case there were only seventeen, but I felt justified in giving a clinical picture of the disease, and in assigning it an anatomical basis. The chief clinical features were: "The appearance, usually before the age of twenty, of anemia without evident cause, with loss of strength, dyspnea, and emaciation; hemorrhages in skin, mucous membranes (epistaxis), or internal organs (retina); rapid pulse; ocular symptoms, such as difficulty of vision, strabismus, and especially exophthalmus, without the special features of Basedow's disease and with tumor in the orbit; deafness and ringing in the ears, and tumors in the temporal regions, or in the cranium in other parts, or in other parts of the body." Besides the resemblance of the symptom-picture to that of many cases of leucemia, especially acute leucemia, three out of nine cases of chloroma, observed since leucemia was known, showed "an increase of the leucocytes, two of them an increase such as is seen usually only in leucemia." At that time leucemia was not so well known as it is now, and I felt obliged to devote considerable space to a consideration of the histology of the blood. I also discussed the position of the anatomical change in chloroma and concluded that it might better be termed lymphoma (in the sense originally used by Virchow, who gave leucemia as the first example of the lymphomatous disease) than sarcoma, lymphosarcoma, or lymphadenoma. An interesting feature of the morbid anatomy of chloroma was shown by my analysis, as it had been by some earlier writers—the "predilection of the periosteum, especially that of the head, but also fibrous tissue in general."

This article served to call renewed attention to the subject. Since then more than twenty cases have been reported, some of them with elaborate studies, though without demonstrating any essential changes in the clinical and anatomical conceptions of the disease. Recently I was fortunate enough to have another case. Like many others it could not be investigated as thoroughly as it deserved, but I have thought it might well serve as the basis of an analysis of the cases reported since my former paper was published. The anatomical study of the case has been made by my friend and colleague, Dr. A. S. Warthin, whose investigations in the anatomy and pathology of the blood-forming organs have already been so valuable.

Clinical Summary of the Case.—Weakness, anemia, headache, tinnitus, deafness, of one year's duration; loose teeth; emaciation; leucemic changes in blood; death from asthenia. L. J., aged forty-five years, farmer, Swede, admitted to the Medical Clinic, Hospital of the University of Michigan, December 1, 1903, on account of weakness and anemia. His father died at sixty-one years of age, from an acute illness; his mother died at eighty-two, of a disease characterized by difficult breathing. Patient has been married twice; has had two healthy children by each marriage. Patient was strong as a child. He had measles at six years; since then has never required a physician until the present illness. Denies venereal diseases. Was a farmer in early life; then worked in the woods and in lumber mills from 1883 to 1891; then resumed farming. He formerly used alcohol in excess; has taken none in the last year, and has also given up tobacco in the last year.

The present disease began in November, 1902, with a feeling of fatigue and dyspnea on exertion. Treatment was without benefit. For six weeks the patient was confined to bed by weakness; "his pulse could hardly be felt." In the early part of the disease he complained of pain in the left side of the head. Hearing was gradually lost, while a pounding noise, like that of a railroad train, was present. Also in the early stage the teeth became loose, without salivation or other local symptom. A change in the color of the skin was noted in the very beginning. There has been a gradual loss of weight, amounting now to twenty-five pounds. The appetite is fairly good; bowels constipated. The patient sleeps well. He complains of dyspnea only on exertion, but says he is very weak.

[1] Chloroma and its Relation to Leucemia, The American Journal of the Medical Sciences, August, 1893.

Status Presens, December 2, 1903.—Man of large frame; muscles small and soft; panniculus thin. In the right axilla are three enlarged glands, the largest the size of a white bean; no other superficial glands enlarged. The expression is weary and apathetic. Deafness and seeming lack of intelligence render the examination difficult. The face is pale and sallow; the skin over the body very pale, but not sallow; over the legs and arms sallow. On the abdomen, just below the right costal margin, is a pale brownish pigmentation. There is a dark-brown line in the skin extending from the tip of the ensiform to the pubes, and an irregular brownish patch in the right lumbar region, but no pigmentation in other parts of the body. The skin in general is smooth, dry, and elastic. Over the right shoulder is a mass the size of a large orange, firm, elastic, movable under the skin, but fixed below. A smaller, softer, bilobed mass occupies a similar position on the left shoulder (lipomata?). There is no edema. The skull shows no abnormality except two scars on the left malar and left frontal regions respectively from injuries. The scleræ are very pale; pupils equal and react well. The lips are pale; there is marked *fetor ex ore;* tongue dry, pale, with thin gray coat, fissured and marked by teeth. The teeth are worn, but only a few are missing. The gums are red, slightly swollen, their edges covered with a grayish-green deposit extending from the teeth, removable by rubbing. Pharynx negative. Auscultation and percussion of lungs negative. Apex beat in the fifth intercostal space, nipple line. Dulness not enlarged. Sounds are clear, except the first in the pulmonary area, which is replaced by a long, loud, blowing murmur. Radial artery not thick nor tortuous. Pulse of moderate size, quick. Blood pressure (Riva-Rocci) 133 mm. The abdomen is below the level of the ribs; inspection and palpation negative. The spleen cannot be felt. There is marked pain on pressure over sternum and tibiæ.

Urine. No albumin or sugar; few leucocytes; many cylindroids. Owing to the patient's lack of intelligence and his unexpected death the urine examination was not complete. Albumose tests not made.

Blood. Pale and watery; fresh drop shows few red cells, varying in size and shape; leucocytes increased. Red blood corpuscles 509,600, leucocytes 35,669, hemoglobin 15 per cent. For differential count see below.

December 5. Examination of stool (Dr. Dock); large and formed; good digestion; no blood, pus, or mucus; no protozoa or ova. Three test breakfasts were given (one Boas') and examined. All showed absence of acid, slight excess of mucus, little or no peptic digestion (Mett.). The temperature ranged between 98° and 102.5° F., pulse 94 to 108, respiration 18 to 26.

December 8. Became restless in the night. Skin cold; delirium; refused nourishment, temperature, 96° F.; pulse, 100; respiration, 28.

Ophthalmoscopic Examination (Dr. Carrow).—Numerous hemorrhages in both retinæ; vision much impaired.

Subcutaneous injection of physiologic salt solution at 10:37 to 10:50 A.M., 12 ounces. Riva-Rocci 108 at beginning, 100 at end. Pulse weaker. Died 11:28 A.M.

The blood was stained with hematoxylin and eosin, Ehrlich's triacid, and Wright's stains.

EXAMINATION OF THE BLOOD. DIFFERENTIAL COUNTS.

Date.	Red blood cells.	Leucocytes.	Hemoglobin.	Normoblasts.	Megaloblasts, degenerated.	Free nuclei.	Small lymphocytes.	Large lymphocytes.	Lymphocytes, marrow.	Polynuclear.	Eosinophile, polynuclear.	Eosinophile, mononuclear.	Myelocytes.	Transition and mononuclear.	Basophile.
December 3.....	509,600	35,669	15	...	1	...	6.7	3.9	79.9	7.4	0.8	...	0.4	...	...
December 4.....	.....	.....	...	...	...	1.8	6.9	5.3	79.6	5.7	0.3	0.1	0.2	...	...
December 6.....	.....	.....	...	1	...	...	5.8	5.0	82.6	5.6	0.2	...	0.1	0.5	...
December 8.....	820,000	.....	15	1	...	...	2.5	2.3	81.6	7.4	2.0	0.2	1.9	1.3	0.4

The counts given are all taken from Wright's stains, which correspond closely to the hematoxylin and eosin counts. The triacid was used only to confirm the neutrophile myelocytes. The blood shows very few nucleated red cells, almost all normoblasts. The only megaloblasts found had degenerated nuclei.

In all the preparations of one day, December 4, there are many "free nuclei," up to 18 per 1000 leucocytes. At other times these are too few to count. They are very small, stain intensely, and show no protoplasm. The small lymphocytes are unusually typical, but some of them show slight fragmentation of the nucleus. There is a small proportion of typical large lymphocytes, some of which also show fragmentation of the nucleus. These two groups together are only slightly increased above normal.

From 79.6 to 82.6 per cent. of all the leucocytes differ from typical lymphocytes, but resemble these cells in certain respects, and differ still more from other normal leucocytes. They closely resemble the undifferentiated lymphocytes of the bone-marrow, and for convenience I class them in the table "marrow lymphocytes." They

range from the diameter of a red blood corpuscle to two or more times that size. They are often oval or even broadly spindle shaped. Many of them have no visible protoplasm. Others show a narrow, crescentic, or annular rim, and still others a wider protoplasm up to an amount usual in large mononuclear cells of normal blood. In most cells of this class the nucleus is round or oval, almost or quite filling the cell. In some the nuclei are reniform, or more or less incised on one side, or sometimes bilobed. Sometimes the two lobes partly overlap; sometimes they are partly or quite separated. When there are two nuclei these are sometimes unequal. The nuclei stain moderately well with hematoxylin and methylene blue; faintly with triacid. They look unevenly blurred in many cases, but in general stain like the nuclei of large lymphocytes, and marked failure to take the stain and other evidences of degeneration, so often seen in leucemic blood, are unusual. The protoplasm usually takes a blue with Wright's stain, sometimes darker than the nucleus, without granulation, but often with a spongy or reticulated appearance. Triacid stains it a pale pink or not at all. Eosin can be almost entirely washed out, but sometimes leaves a pale pink, and in some cells stained with hematoxylin and eosin the protoplasm of these cells has a pale blue tint. The protoplasm is sometimes ragged at the edges; sometimes there are few or many knob-like processes on the edges, stained a pale blue, and having a smooth, homogenous appearance. These cells cannot be separated readily from those classed large mononuclear, so far as general appearance is concerned. The distinction here is based upon the different appearance of the protoplasm and the relatively smaller and more distinct nuclei in the large mononuclears. While those classed as marrow lymphocytes, as well as the large mononuclears, have no granulations in the protoplasms, there are a few cells having the general shape and proportions of large mononuclears that show a few eosinophile granulations, sometimes very small ones, scattered over a pale and sometimes vacuolated protoplasm.

The polynuclear cells vary much in size, nuclear structure, and protoplasm, resembling in their polymorphism the polynuclears of mixed-celled leucemia. In size they vary from one to four times the diameter of a red blood cell. The nucleus is sometimes in separate parts, especially in the larger cells. The nuclei stain deeply as a rule, but the large ones show a reticulated structure with thickening at the nodal points. The protoplasm shows, with proper stains, a fine, or in rare cases somewhat coarse, acidophile or neutrophile granulation. A few of the smaller cells of this group are probably Ehrlich's pseudo-lymphocytes.

The polynuclear eosinophiles, relatively rather low, but absolutely within normal limits, show no marked abnormalities in size or structure. Many have nuclei less polymorphous than in normal blood, but still within the range of variation in such cells in general.

Mononuclear eosinophiles were present only two days out of four in small proportion. Most of them are large, but some are about the size of red blood corpuscles. In some the protoplasm is very narrow. I have counted among the eosinophile cells some that have very few granules, as mentioned above. In one cell, not included in any of the counts, a "marrow lymphocyte" without protoplasm, there were ten large eosinophile granules scattered over the cell without any explanation by way of artefact.

The myelocytes (neutrophile) vary in the usual manner from small to large. Some of them have vacuoles in the protoplasm.

Basophiles appeared only on the last day. They all have round or elliptic, excentric nuclei. Some are small, some large.

The red blood corpuscles show slight changes aside from their very scanty number. The cells vary somewhat in size, but marked departures in size and shape are not present. The cells take the usual stains well; they show very little polychromatophilia. Normoblasts are few. No typical megaloblasts are to be found, but some of the large nucleated red corpuscles have trefoil or irregular nuclei.

During the patient's lifetime the full details of the blood were not known, but I had carried the examinations far enough to show that while the blood resembled in general that in many cases of acute leucemia it had some important differences in the details of the cells as well as in the differential count. It was more polymorpheus than is usual in acute lymphocythemia, and resembled somewhat closely the blood of a case of acute lymphocythemia with extensive intestinal lesions that I had studied a short time before, and a report of which will be made by Dr. Warthin.

The diagnosis, as made at a clinical conference December 4, was: acute leucemia, possibly lymphocythemia, in the late stage of a severe anemia of unknown cause. The points of resemblance, and of difference as compared with pernicious anemia with late lymphocytosis, were brought out. Chloroma did not then seem as probable as acute lymphocythemia with lesions in the alimentary tract, but before the autopsy, on account of the absence of distinct gastrointestinal symptoms while under observations, I thought chloroma was more probable, notwithstanding the absence of the peculiar head symptoms.

Permission to make an autopsy was obtained with great difficulty and after much loss of time. It was impossible to examine the head, and owing to lack of time the examination of the other bones was seriously limited.

Autopsy protocol, December 9, 1903, 10 A.M. (Dr. Warthin.) Body well built. No deformities or anomalies. Length 160 cm. Abdomen on level of ribs. Left side of thorax not as full as right. Musculature fair; muscles in fair con-

dition. Rigor mortis marked, present throughout. Panniculus moderate. Slight edema over ankles. Body heat entirely absent. No signs of decomposition.

Skin is very pale on the whole. There is pale red hypostasis over the back. The flexor surfaces of both upper and lower extremities show no unusual pigmentation. Over the upper portion of the right thigh there is an area about the size of a hand showing scattered spots of pale-brownish pigmentation. In the median line of the abdomen there is a pale linea fusca. The wrists and back of hands are tanned. Over the inner side of the right elbow there is a small ecchymosis, and numerous small petechial hemorrhages are scattered over the flexor surfaces of both upper and lower extremities being most marked over the left arm and less numerous over the lower extremities. Transfusion mark in right pectoral region. The hair is thin over the vertex, and harsh and dry. The beard is slightly gray. The teeth are in fair condition.

Over the outer third of the left clavicle there is a subcutaneous tumor 7 cm. long by 5 cm. wide. It is slightly lobulated and at its lower pole there is a smaller mass 2 cm. in diameter. The tumor is freely movable, is not adherent to the skin, is semielastic. Over the outer third of the right clavicle there is a similar roundish tumor 7 cm. long by 6 cm. wide. It is firmer in consistency and is less freely movable than the growth on the left. It is not adherent to the skin and does not seem to be attached to the periosteum. It does not move with the arm. Both tumors present the characteristic of lipomata.

The axillary glands are palpable, but not enlarged. Cervical glands not enlarged. The inguinal glands are just palpable, not enlarged.

The head was not opened. (No permission.)

On section the muscles are pale brownish-red; panniculus a pale lemon-yellow.

The diaphragm is at the fourth intercostal space on the right, and at the fifth rib on the left. The first costal cartilages are ossified.

On removing the sternum its inner surface is found to be covered with a dense infiltration about 1 cm. thick and having a distinct light grass-green color. The infiltration is most marked over the upper part of the sternum and here the color is more decidedly greenish. The sternum is softer and more friable than normal, and is easily fractured or cut. The sternal marrow is hyperplastic, pyoid in character, and has a slight greenish tinge. Exposure to the air and slight drying caused the green color of both the infiltration and marrow to become more marked.

The mediastinal fat is of fair amount, and of a pale lemon-yellow color. Contains a few small pale lymph nodes. In the thymus fat there are several large lymphoid structures, one of which is about the size of an English walnut and has a greenish-gray color. On section it is very edematous, medullary in consistency, greenish-gray, and showing fine lines of anthracosis. The other lymphoid structures in this region are soft, grayish, edematous, and more or less anthracosed.

The apex of the heart lies in the fifth intercostal space half-way between the left paresternal and nipple lines. The heart extends four finger-breadths to the right of the median line. No fluid in either pleural sac.

The pericardium is distended. Contains 40 c.c. of clear fluid, the increased intrapericardial tension being due to dilatation of the heart.

The heart is much enlarged, the enlargement being due chiefly to dilatation of the auricles. Weighs about 700 grams. On the anterior wall of the right ventricle there is a large, triangular, tendinous spot measuring 5 x 5 x 4 cm. Near the apex of the left ventricle there is a smaller one measuring 2 x 1 cm. Smaller ones on the posterior wall of the right ventricle. The subepicardial fat is increased in amount and is of a pale lemon-yellow color, translucent, and edematous. Everywhere over the surface of the heart along the course of the smaller vessels there are great numbers of small, punctate hemorrhages. They are most numerous on the posterior wall near the apex. Coronary veins greatly distended. The auricles contain pale plum-colored blood and large white clots. The walls of both ventricles are lined with similar white clots. The mitral and tricuspid orifices are dilated. The heart muscle is pale and soft.

The left lung weighs 1,000 grams and measures 28 x 18 x 6. Pleura adherent posteriorly and over base by old and rather tough adhesions. The lung is voluminous, pale grayish-pink above, and moderately hypostatic posteriorly. On section it is very edematous, yielding an abundant foamy exudate on slight pressure. Very small, whitish, airless areas throughout. Anthracosis moderate.

The right lung weighs 1,120 grams and measures 30 x 18 x 6. Adherent posteriorly and over the base by very firm adhesions. Pleura covered with the remains of old adhesions. Lung very voluminous. Color similar to that of left lung. Consistency somewhat more firm than that of left lung and the cut surface is darker in color, otherwise similar. The small, whitish, airless areas are more numerous in lower lobe.

The pulmonary veins contain large pale clots. The mucosa of the larger bronchi is pale, that of the smaller is injected. The smaller bronchi are somewhat dilated. The bronchial glands are enlarged, very pale gray, soft, and edematous. Thoracic duct negative. Thoracic and cervical esophagus negative.

No pathological changes in mouth and throat so far as could be ascertained (section not permitted). Neck organs examined from below. No pathological changes found.

No fluid in the peritoneal cavity. The omentum is rolled up; moderately rich in fat of a very pale yellow color. The lower border of the stomach extends one finger-breadth below the umbilicus. The lower edge of the liver in the median

line is four finger-breadths below the ensiform and one finger-breadth below the edge of the ribs in the right nipple line. The pylorus is four finger-breadths to the right of the median line. The colon is contracted, filled with hard, fecal masses. The duodenum is moderately dilated; the remaining portion of the small intestine is collapsed. The appendix is very long and large, the distal one-third dilated. The greater part of the appendix lies in the pelvis and is attached to the sigmoid flexure by recent adhesions, which are very vascular. The peritoneum about the appendix is thickened. No evidences of any perforation, old or recent.

The spleen weighs 426 grams and measures 17 x 11½ x 5 cm. It is rather soft and flattens on pressure. The capsule is slightly thickened and over it there are scattered small hyaline tags. There are four distinct notches on the anterior border. On section the pulp is pale red, soft, swells up above the stroma, and is easily scraped away. The stroma is covered up by the hyperplastic pulp. The follicles are very few and small, and can be seen only in a few places near the capsule. The cut surface presents a moderately shagreened appearance and is of a uniform pale red.

The left adrenal is very small, completely surrounded by pale-yellow fat. On section it shows no change. The right adrenal is likewise very small and embedded in a thick capsule of pale fat. On section shows post-mortem change of the medulla, otherwise negative.

The left kidney has a very thick fatty capsule of a pale lemon-yellow. The fibrous capsule is stripped with some difficulty. The organ freed from its capsules weighs 190 grams and measures 14 x 6½ x 3½ cm. The cortical surface is very pale and slightly granular. Traces of the fetal lobulations are present. The cut surface is very pale and cloudy. The outlines between the labyrinths and medullary rays are not distinct. The consistency is somewhat diminished. The pelvis presents no pathologic changes. The subpelvic fat is very abundant.

The fat and fibrous capsules of the right kidney are similar to those of the left. The stripped kidney weighs 190 grams and measures 17½ x 7 x 3 cm. The organ contains more blood than the left, the outlines between the medullary rays and the labyrinths being more distinct. Scattered over the cortical surface are small, slightly elevated, pale yellowish or grayish spots about 2 mm. in diameter. On section these spots are nearly round and are located for the greater part just beneath the cortical surface. They are fairly firm and are not affected by pressure. When scraped with the point of the knife they yield an abundance of cells. In other respects the appearances resemble those seen in the left kidney.

The ureters are dilated and filled with slightly turbid urine. The bladder is greatly distended and filled with slightly turbid urine. Its wall is thin, and the mucosa very pale. No other changes.

(The stomach was ligatured at the cardiac orifice and removed in connection with the intestines, which were ligatured at the rectum. The contents were preserved for chemical examination.) The stomach is dilated, its wall thin, and the mucosa very pale. Lymphoid follicles prominent. In the submucosa of the fundus there is a small round tumor about the size of a pigeon's egg. The mucosa is intact over the growth, which has a firm consistency.

The intestines are very pale. The lymphoid structures are rather prominent, but not distinctly enlarged.

The liver weighs 2,230 grams; its greatest measurements are 29 x 20 x 11 cm. The general color of the organ is a light yellowish-brown. Over the surface and just beneath the capsule there are many small, yellowish or whitish spots. On section these spots extend a short distance into the liver substance, so that they appear as round or oval areas about 2 to 4 mm. in diameter. They are sharply circumscribed, fairly firm, but yield an abundance of cells on scraping with the point of the knife. Besides these small spots there are seen underneath the capsule larger pale areas, less sharply circumscribed, and of a more reddish-yellow color. On section these areas also extend into the liver and appear to be made up of groups of liver lobules that have suffered some parenchymatous change. On the main section a narrow strip of liver lobules showing characteristic nutmeg appearance is found just beneath the capsule. The remaining portion of the organ is very anemic, the central veins empty, and the lobules small and of a light chocolate color. Similar small, yellowish areas to those seen underneath the capsule are scattered over the surface.

The gall-bladder is adherent to the omentum. It is moderately filled with dark greenish-brown bile. No stones or sand. Bile passages patent. Examination of portal vein is negative.

The pancreas is about normal size, very pale, and somewhat softer than normal. Section negative.

The mesenteric lymph glands are slightly enlarged, pale and soft. The lymph glands of the portal fissure are very large, pale, soft, and homogeneous on section. The retroperitoneal glands are moderately enlarged, very pale, and of medullary consistency. The hemolymph nodes are pale, but present no other gross changes. No greenish color seen in any of the abdominal or retroperitoneal lymph glands.

The examination of the sexual organs, internal and external, is entirely negative.

On stripping back the prevertebral tissues the bodies of the vertebræ are found to be covered with flattened greenish masses varying from 4 to 10 mm. in thickness. Over the intervertebral disks the greenish color barely shows, so that the greenish vertebræ are sharply outlined from each other by the whitish disks. In the lumbar region the color is most marked over the bodies, but in the thoracic region the greenish tissue is more

marked along the sides of the vertebræ. The greenish tissue extends for a short distance over the ribs. It also infiltrates to some extent the prevertebral fat-tissue. A thin layer of the greenish tissue is found in both iliac fossæ and over the inner side of the sacrum. It is not present on the clavicles or on the long bones of the lower extremities. The bodies of the vertebræ are very soft and are easily cut with the cartilage knife. The marrow spaces are increased in size and the bony trabeculæ greatly rarefied. The red marrow is entirely replaced by a grayish pyoid marrow having a distinct green color. After exposure to the air and drying, the grass-green color became more marked. On cutting into the vertebra, direct connection can be seen in many places between the greenish tissue surrounding the vertebral bodies and the greenish marrow of the enlarged marrow spaces. The greenish tissue is firmly adherent to the surface of the vertebræ and cannot be stripped from it.

Careful and thorough examination of the head fails to reveal any evidences of periosteal thickening. There is no sign of the presence of orbital growths.

(The dorsal and lumbar portions of the spinal cord were removed.) Cord and meninges present no pathologic appearances. The bony wall of the canal is covered with a thin layer of greenish tissue.

The right tibia is split. Its fatty marrow is partly replaced by marrow redder than that found in either the sternum or vertebræ, but small points of pyoid, greenish-gray marrow are also present.

The section of the growths on the right and left clavicles shows that these are subcutaneous tumors having all the gross characteristics of lipomata.

Anatomical Diagnosis. The character and location of the greenish growths in connection with the changes in the red marrow form a sufficient basis for the diagnosis of chloroma.

(To be Continued.)

COMPLICATIONS OF DIPHTHERIA: WITH SUGGESTIONS FOR THE FEEDING, MEDICINAL AND HYGIENIC TREATMENT.

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The Stomach.—The first effect of a diphtheritic toxemia is manifested on the stomach. We know that the diphtheritic toxin seems to inhibit the production of hydrochloric acid. Behring's theory is that the cells and the cell elements are disturbed in their activity by the action of the toxin and that the antitoxin stimulates their activity. The truth of this statement must be admitted when we compare what can easily be proven experimentally, that twenty-four to twenty-eight hours after the injection of antitoxin, hydrochloric acid was again present in the gastric juice.

Large Dose Required.—The question of dosage is important enough to consider in this connection. I have frequently found that a dose of 5,000 units was *not sufficient* in a severe case of septic diphtheria. When a second dose of 5,000 units was given no improvement was noted until twelve hours later, so the third dose of 5,000 units was given twenty-four hours later. Ten thousand units can be given in twenty-four hours, and even more, if necessary. I have come to look upon the employment of antitoxin in the same light as when an active drug is to be given. Take for example the effect of belladonna on the system. This drug will frequently be inert until its physiological effect is produced. One child will show its physiological effect after a very small dose of belladonna, while another child, more robust, can tolerate three times the dose to produce the same symptoms.

Feeding.—This has an important bearing on the prognosis of a case of malignant diphtheria. Knowing the effect of the diphtheritic poison, it is imperative to sustain the system by proper feeding. As there is a decrease in the quantity of hydrochloric acid secreted we must allow for this in ordinary food. An infant should be given one to five drops of diluted hydrochloric acid after its feeding, and if digestion is not improved, we must resort to predigested milk food consisting of peptonized milk.

When bottle-feeding or cup-feeding is unsuccessful, or when children refuse food, gavage should be remembered. Gavage through the nose is the plan of feeding very rarely used at the Willard Parker Hospital. In some cases the Casselbery method of feeding has served me very well. When vomiting is provoked by gavage and the tube is coughed out, I have frequently resorted to spraying the pharynx with a three per cent. cocaine spray several minutes before the time for feeding. When this method does not relieve the nausea and vomiting, absolute rest of the stomach is indicated, and we must resort to rectal feeding. Rectal alimentation should be given only by a trained nurse or by the physician himself. I have had excellent results in the feeding of intubated cases by rectal alimentation when the same was carried out by one who was competent. The rectum and colon are first washed clean by means of soap water. After the fecas are washed away I usually instruct the nurse to wait one-half hour, and then inject two or three ounces of the following:

℞ Yolk of egg	1 yolk.
Starch water	2 ounces.
Fairchild's peptonizing powder,	1 tube.
Salt	A pinch.

Mix thoroughly and inject slowly into the colon through a funnel to which a soft rubber catheter is attached. These injections may be repeated every four hours.

Nasal Cases.—In nasal diphtheria very high fever frequently persists. Great relief is afforded

by irrigating the nose and removing these membranous plugs. Septic infection will persist until the nose is thoroughly cleaned. The ease with which a membranous patch will extend upwards from the posterior pharyngeal wall should be remembered when determining on a plan of treatment. When the membrane exfoliates it will result in serious impediment to the entrance of oxygen. Mechanical treatment by means of normal saline solution will wash away these septic plugs and relieve obstruction to the entrance of air. Attention to the nose is more important in diphtheria than in any other disease. My rule has been to wash the nose with a weak permanganate of potash solution, or normal saline solution, *whether the case has a tube in the larynx or not.* My experience has been so good in tube cases that I do not *hesitate to advocate the use of nasal washing in every case of diphtheria* as a routine measure. Toxic substances can be more directly eliminated in this manner than by any other means.

Enlarged Lymphatic Glands.—I have frequently seen enlarged lymphatic glands greatly improve during the course of diphtheria when these necrotic patches were removed from the nose by cleansing. I believe that the same holds good in the treatment of lymphadenitis cervicalis and in scarlet fever.

Feeding.—When the appetite is so poor that milk will be refused, especially during acute febrile attacks, the curd should be removed from the milk by making junket and straining the same. Whey can be given in small quantities more often than milk containing the curd. Vegetable proteids can be fed in the form of soup made from split peas or lentils, or in the form of almond milk made by macerating almonds with water.

The Bowels.—Next in importance is the *elimination of poison through the bowels.* The treatment of diphtheria in children would always be commenced by producing active catharsis. The frequency with which pseudomembranes and infected secretions are swallowed shows the importance of this treatment. Children rarely, infants never, expectorate—they invariably swallow the loosened membranes. By producing liquid stools we eliminate toxins and thereby reduce the amount of toxemia. The best drug for cleansing the intestine is undoubtedly calomel. It is best administered by giving a large dose followed by repeated small doses. Salines are also advised. Vomiting will sometimes be produced after the administration of calomel; if so, then vegetable cathartics such as elaterin or podophyllin in 1-10 gr. doses or more should be tried. This active catharsis should be continued during the whole course of treatment, or until convalescence is established. We need not fear to deplete the body by this active cleansing, especially if we aid the volume of blood by introducing normal saline solution, as I shall describe later.

The Heart.—Next in importance to the conditions previously outlined is the effect of the toxin on the heart. When this condition is encountered great skill will be necessary to guide the patient to a successful recovery.

A study of the pathology of this disease will show the destructive effect of the toxins in the system. The retention of these poisons in the blood is a danger. Such danger consists in the development of *toxic myocarditis,* and unless the poison is eliminated, death may result. The toxin can be eliminated chiefly through the kidneys, skin and bowels.

Toxic Myocarditis.—Just as we treat the general toxemia by elimination through the skin by subcutaneous injections of hot water, through the bowels by catharsis, and through the kidneys with active diuresis, or by injecting hot saline solution into the colon, the destructive tendency of the toxin must be borne in mind if we wish to avoid death. We must remember that unless very vigorous treatment is instituted paralysis is possible, if the patient recovers.

Sustain the Heart.—The feeble condition of the heart's action requires active stimulation. Alcoholic stimulation by means of whisky, or better yet, by champagne, liberally administered, is of prime importance. I have frequently given one or two pints of champagne in twenty-four hours, in doses of one wineglassful every hour or oftener. Into the champagne strychnine can be given, 1-60 of a grain, every hour to a child one year old. Whisky should be administered freely, two or three teaspoonfuls well diluted can be given every hour, combined with strychnine.

We must not fear giving heroic doses, for it is only by heroic treatment that we can win in a deep-seated case of septic diphtheria. Tincture of musk in two to five minum doses every hour is valuable. The musk must be pure Tonquin musk. Hot coffee, into which small doses, 1-10 to 1-5 of a grain of sparteine is given, can be repeated every two or three hours.

Hypodermic Medication.—Several pints of normal saline solution are given first choice. The injection of ten to fifteen drops of spirits of camphor or camphorated oil will frequently have a toning effect on a weakened heart.

Throat and Lungs.—The treatment outlined for the relief of a general toxemia applies equally well, although indirectly, to the care required by the respiratory apparatus. Stenosis of the larynx demands the usual operative treatment, namely, intubation. One important point is essential, *i.e.,* that we admit all the fresh air possible to oxygenate the lungs. When we are dealing with crowded apartments and unsanitary surroundings, then pure oxygen should always be given. I make it a rule to exclude all the family from the sick-room, excepting the trained nurse, the mother, and father. To permit friends or several members of the family to go in and out of the sick-room is simply robbing the patient of oxygen in his struggle against death.

Position.—The semirecumbent position should be remembered to guard against hypostatic congestion of the lungs. Pneumonia, if present, must not necessarily be looked upon as a fatal complication. I have seen many cases get well both in hospital and private practice.

Local Treatment of Pneumonia.—The application of dry cups, three or more over the affected area, or a sinapism, to be repeated in twenty-four hours, will frequently relieve dyspnea or interference with breathing. This will also be valuable when cyanosis exists. Carbonate of ammonia is one of the best diffusible stimulants, and should be remembered in the pulmonary complications of diphtheria. It can be given in doses of one to five grains with or without a stimulant, repeated every hour until its systemic effect is apparent.

Hypodermoclysis.—Sometimes saline colon enemata are too difficult to manage, owing to lack of assistance or an uncontrollable child. When a child has a tube in its larynx for the relief of croup it may be advisable to avoid struggling, owing to the danger of excitement and the probable coughing up of the tube. At such times the hypodermic injection in the loose cellular tissue of the abdomen of a pint or more of hot saline solution will be equally well absorbed. For the latter method a long aspirating needle can be attached to a fountain syringe.

Nephritis.—In every case of toxemia, systematic examination of the urine is demanded. The quantity of urine should be noted for the reason above stated, that the glands of the body do not functionate properly. A specimen of urine should be procured and centrifuged. The sediment should then be examined microscopically for the presence of casts. The chemical examination should be made to determine the presence of albumin and blood. I do not lay much stress on the latter, but rely chiefly on the microscopical result. Active diuresis is demanded so that the system is drained of its poison through the kidneys. One of the best drugs to stimulate the kidney is strychnine. Another drug used to advantage is nitroglycerin. When scanty urine exists, then diuretin in doses of three to fifteen grains, three or more times a day should be tried. If vomiting or other gastric disturbances exist then diuretin in ten to fifteen-grain doses can be put into a suppository and administered per rectum. Sweet spirits of niter is a useful stimulant and diuretic in doses of ten to fifty drops every hour or two, as the exigency of the case required. Alcoholic stimulation, such as champagne, is not contraindicated even though nephritis exists.

Indications for the Introduction of Liquids into the Body.—What has previously been said in regard to the inactivity of the glands of the stomach applies equally well to the kidneys. The toxin paralyzes the secretory and excretory functions. It behooves us, therefore, to aid these functions by proper stimulation, hence large quantities of liquids are demanded. I have previously mentioned the necessity of warm saline solutions. The same can be introduced by means of a soft flexible colon tube or a rubber catheter attached to a fountain syringe. The temperature of the saline solution should be at least 115° to 120° F. When this is introduced slowly and the child becomes accustomed to the presence of the catheter it is not difficult to introduce several pints of hot salt water. This can be repeated every three or four hours, depending on the result following the injection. The pulse should show more regularity and usually more tension will be noted. The heart's action should be stronger and the heart sounds clearer.

A few facts of decided clinical importance have been noted by me at the bedside in the hospital: First, that *the temperature alone is not a sure guide as to the outcome of a case of diphtheria. Second, that the heart is the guide, hence a study of the pulse is more important in estimating the prognosis of a case of diphtheria.*

65 East Ninetieth Street.

UNCINARIASIS AS SEEN IN NORTH CAROLINA; ITS FREQUENCY, ETIOLOGY, PATHOLOGICAL SIGNIFICANCE, SYMPTOMS AND TREATMENT.[1]

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INTRODUCTORY:

My attention was attracted to this interesting and important malady by a case admited to the Maryland University Hospital, June, 1903, where I was then resident pathologist. This case was sent in from the dispensary, diagnosed malaria. Blood was negative, and showed absence of Widal. Differential leucocyte count showed an eosinophlia of 11 per cent. Stool examination by Dr. Wm. I. Mesick and myself resulted in diagnosis of uncinariasis, a diagnosis which Dr. Stiles kindly confirmed for us. So far as I can find recorded, this is the first case ever diagnosed in above hospital, and the fourth case recognized in Maryland.

Having become interested, I collected most of the American literature bearing on the subject, and on reading this literature, was very much impressed by the apparently exaggerated claims of every single investigator of the disease on the one hand, and on the other hand by the non-acceptance of these claims by the general profession, as manifested by the small number of cases and the scanty literature.

Hear some of these claims: Dr. Stiles says, "There is in fact, not the slightest room for doubt, that uncinariasis is one of the most important diseases of this part of the South. In

[1] Part of paper was read before the North Carolina Medical Association, Raleigh, N. C., May 23, 1904.

frequency it belongs in the general class with malaria, tuberculosis and gonorrhea." He was writing from South Carolina. Dr. H. F. Harris, of Atlanta, says: "The most common of the severe diseases of the South." Dr. Bentley K. Ashford, Assistant Surgeon, U. S. Army, from Porto Rico, writes: "This disease is the most destructive and general disease of Porto Rico."

Now add to this the unqualified endorsement of every single investigator of this disease, and you have one side of the question.

Let us now see the other side: The first case definitely recognized in this country was by Blickhahn, of St. Louis, in 1893. Up to January, 1900, there was only seven cases in American literature. In January, 1903, Dr. Capps, of Chicago, could collect only fifty-one cases in American literature, and since then the number has been increased, so that now we can find about 160 or 170 cases. So from these facts, we find an ignorance or skepticism concerning the importance of above claims, making the question one with two sides, at once becoming interesting and inviting to investigation.

My position as resident pathologist to the above institution expired in June, 1903, and in July I located in Onslow County, N. C., a sandy, warm country. I had not been there long before I encountered several cases. Then it was my good fortune to meet Dr. J. L. Nicholson, for whom I diagnosed microscopically several other cases. We were at once impressed with the great frequency of the disease, and realizing the truth of the above claims, and also that the disease was not attracting the attention in North Carolina that its frequency and importance deserved, we decided to investigate it as far as our means and time would allow. The primary object of the investigation was to show the frequency, and secondarily to learn what we could concerning the etiology, symptoms and treatment. Our plan of work was greatly facilitated when I was called to the chair of Pathology at Wake Forest College in September, 1903.

Plan of Investigation.—In October we proposed a canvass among the doctors of different counties scattered in various sections of the State, to the State Board of Health, provided they pay our expenses. The offer was accepted and the Board of Health had printed a number of circular letters, one of which was mailed to each doctor in a county together with a personal appeal, asking the doctor to collect stools from patients suffering with symptoms of uncinariasis. In the letter we also stated that we would visit the doctor's office in about ten days and with a microscope which we carried with us, we would examine all the stools collected, free of charge. One week of this work, in the latter part of December, proved very discouraging. Many of the doctors had not collected a single specimen, and only a few had collected one specimen. In the whole week's work, only four cases were found. Returning to Wake Forest, I began an examination of students, examining *all* the students from one county, before starting on a new county. We have kept etiological records (blanks) of all our cases. In these records the mode of conveyance is especially gone into, particular attention being paid to dirt-eating, drinking water and ground-itch. In all we have diagnosed and studied 147 cases since September and the contents of this paper is based upon a study of these cases. We shall ask pardon for the repetition of parts of the subject already gone into in other journals, in order that we may preserve the continuity of our theme.

Historical.—Our oldest reference to a disease which was most probable uncinariasis, is contained in an old Egyptian papyrus, thirty-five hundred years old. Here a disease is described whose clinical features are those of uncinariasis. It is further stated that patients suffering from this disease frequently pass worms, a supposed effect of the disease. The next references occur in the seventeenth and eighteenth centuries, when Piso, of Brazil, in 1648, Labat, of Guadeloupe, in 1742-1748, Chevalier, of San Domingo, in 1752, Dazille and Bason, of the Antilles, in 1776, and, lastly, Edwards, of Jamaica, in 1793, referred to a disease with an anemia of this special type. In Europe the disease was first discovered among the miners of Ansin in 1802. The special cause of the European type was discovered by Dubini, of Milan, Italy, in 1843.

In this country our earliest references to a disease which was almost surely uncinariasis is contained in certain records, which refer to an anemia associated with dirt-eating. To the credit of North Carolina, it may be said that the oldest of these records is from Dr. Pitt, occurring in 1808, who describes this clinical condition in dirt-eaters along the Roanoke River. Following this is Chabert's description of a similar condition among the slaves of Louisiana, then Jordan's of Person County, N. C., description of negro consumption. Then Cottling's, of Richmond County, Ga., in 1836. Little, of the pine barrens of Georgia, and La Conte, Florida, both these last in 1846, and finally Duncan, in 1850, in St. Mary's Parish, La., all describe a condition exactly corresponding to clinical uncinariasis as we now know it.

In 1864, Dr. Ferdinand Herff, of San Antonio, Tex., performed an autopsy on a Mexican woman dying in his care, in whose intestines were found numerous small round worms, which at the time he thought were young ascarides, and he now believes were uncinaria. This is very probably our earliest pathological reference to the American type of the disease. In 1893, Blickhahn, of St. Louis, recognized as such the first case of uncinariasis diagnosed in this country. The case was that of a German, three years resident of the United States, and he most probably contracted the disease in Germany and therefore suffered the European type. This is the last we hear of the disease until 1896, when Mohleau, of Buffalo,

reports five cases, three of which were imported. No other case is recorded until Tebault, of New Orleans, adds it in 1899. This was an Italian boy who developed the disease from New Orleans. We see from this in December, 1900, there were only seven cases recorded in American literature. Then Dr. Bailey K. Ashford records four cases, all imported from Porto Rico. To Dr. Ashford belongs the credit of first seriously directing attention of Americans to this disease. Dyer, in St. Louis, adds another case in March, 1901. Then comes Dr. Claytor's case from Virginia, the first of American type definitely recognized by Dr. Stiles.

Allen and Behrend, from Philadelphia, report another case, imported from Italy, in July, 1901. Dr. Gray, of Richmond, reports two cases from Virginia in September, 1901. Dr. Allen J. Smith reported eight cases before the Texas Medical Society this same year. To Dr. Smith belongs the credit of pointing out the endemic occurrence of the disease. Dr. Schaeffer, of Galveston, added another case in October, 1901, which was imported from Mexico. Still another is reported by Dr. Boggs, of Pennsylvania, the same year. Dr. John L. Yates records the first autopsy on the disease where is was definitely recognized in America. This case was also the first case diagnosed in Maryland. By the end of 1901, there were about twenty-seven cases reported in Americal literature. In January, 1903, Joseph Capps reports an autopsy, and was able to collect fifty-one cases from American literature.

In 1903 Dr. Claytor's paper, before the American Medical Association, at Washington, brought out in discussion Dr. Bondurant, of Mobile, who reported fifty microscopical diagnoses from Southern Alabama, also Dr. Harrison reports three cases from Talladega, Ala. At the same time, Dr. McCaskey, of Fort Wayne, Ind., reports three cases, and Dr. Claude A. Smith, of Atlanta, Ga., said that he had diagnosed so many cases that he had ceased to record them. Then, in the November number of the *American Journal of the Medical Sciences,* Dr. Allen J. Smith reports eight cases more in detail, and in the same issue of this journal, Dr. Craig reports twelve cases occurring in returned Philippine soldiers. This is about all the cases from which we can draw conclusions. The important deductions which we obtain from this array of historical points is, that this disease of a contagious nature has lasted long enough to account for its widespread distribution and frequency.

Frequency.—This is one of the most important points to ascertain. The importance of the disease will rest chiefly, first upon its frequency and secondly its pathological significance. In order that we may have a standard of comparison, let us look at its frequency elsewhere. Since Dubini discovered the cause of the disease in 1843, it has been found in so many countries, that it is very probable that it is endemic the world over between the parallels 51° 30′ north and 30° south. In Egypt it is found in almost every cadaver. So frequent is it, that it is known as Egyptian chlorosis. In India, Manson states that in certain sections, 75 per cent. of the population is affected. In Madras 52 per cent. are affected. In Kiolo, Japan, 13 per cent. In Java, Ceylon, the Straits Settlements, and in this hemisphere, in Brazil and Guinea, it seems equally prevalent. In Porto Rico, last year, one-fourth the death rate was due to an anemia, which in all probability was due to this parasite. The government of the island of Porto Rico has recently appropriated $5,000 for the study of this disease.

Now let us come a litle nearer home and see something of its frequency and distribution in the United States. As above stated, the first case recognized in this country was that diagnosed by Blickhahn in 1893. But the interest of the profession was not aroused until Dr. Stiles brought his painstaking investigation before us in 1902. Of course it has not been studied enough yet to allow more than appropriate conclusions concerning the frequency. But we can say now, that the more the disease is studied, the greater does this frequency appear. The writer on this subject in Allbutt's system, has well said: "To diagnose the disease, one only has to suspect its presence." Its distribution in the United States is as follows:

New York: nine cases reported, seven of these imported and it is not probable that the other two were infected in the State. Pennsylvania: three cases, all imported. Maryland: four cases, all imported. Virginia: three cases, all American type. Georgia: Harris reports thirteen cases, and Claude A. Smith has seen so many that he has ceased to record them. Beside these two observers, Dr. Stiles found the disease very prevalent here. South Carolina: Dr. Stiles in his tour of investigation found sixty or seventy cases. Florida: Dr. Stiles states that it does not differ from Georgia in point of frequency. Alabama: Dr. Bondurant reports fifty cases, and Dr. Harrison three. Louisiana: One case could be found recorded. Texas: Dr. Allen J. Smith in examining the stools of eighty-six students found eight infected. Three other cases could be found recorded from this State. California: Claims fifteen cases, all imported from Philippines and Mexico. Missouri: two cases, both of which were probably imported. Indiana: three cases, all probably imported.

North Carolina.—In this State, when we began our investigation, there were only two cases recorded. These were seen by Dr. Stiles in his Southern tour of investigation. As above stated, the investigation was made by corresponding with doctors, arousing interest and securing the cooperation of a doctor wherever possible. He was asked to send specimen of stools from patients suffering from symptoms indicating uncinariasis, which group of symptoms were mentioned in enclosed circular. The second method

was by systematic examination of students in college. No selecting was done except by counties. Most of the counties from which the students were examined were from Eastern Carolina. The results are truly surprising and almost beyond our conception. In Wake Forest College there are 325 students. About 140 examinations were made and 52 cases, or 37 per cent. of those examined, were found infected. Most of them were mild cases, many without any symptoms whatever. Interesting to compare with these findings are those of Dr. Allen J. Smith, of the University of Texas. He examined the stools of 86 students and found eight cases infected.

Many of the counties showed every man infected. Here are the results of examination according to the counties, which has an important bearing on the distribution of the disease in North Carolina: Sampson Co., six men in college, all infected, 100 per cent.; Pender Co., three men in college, all infected, 100 per cent.; Iredell Co., four men in college, all infected, 100 per cent.; Columbus Co., two men in college, all infected, 100 per cent.; Cumberland Co., one man in college, infected, 100 per cent.; Chowan Co., one man in college, infected, 100 per cent.; Pasquotank Co., one man in college, infected, 100 per cent.; Washington Co., one man in college, infected, 100 per cent.; Wilks Co., one man in college, infected, 100 per cent.; Perquinnans Co., one man in college, infected, 100 per cent.; Northampton Co., one man in college, infected, 100 per cent.; Bladen Co., one man in college, infected, 100 per cent.; Martin Co., one man in college, infected, 100 per cent.; Hertford Co., sixteen men in college, fourteen examined, ten infected, 72 per cent.; Bertie Co., four men examined, two infected, 50 per cent.; Onslow Co., two men in college, one infected, 50 per cent.; Burke Co., three men in college, two infected, 66⅔ per cent.; Henderson Co., two men examined, one infected, 50 per cent.; New Hanover Co., only one man examined from this county and he was infected; Halifax Co., two men were examined and one infected, 50 per cent.; Durham Co., two men examined and one infected, 50 per cent.; Roberson Co., five men examined and three infected, 60 per cent.

South Carolina.—This State furnished six of the above fifty-three cases, distributed as follows: Florence Co., six men in school, four were examined, all infected. Two would not submit stools, but in appearance were as typical as other cases from same county. Another case came from Marion. In the last case I did not get the county. One of the above fifty-three cases came from Sevier Co., Tennessee, a very mountainous county. These are facts, and are not hard to interpret. That there could have been no mistake in recognizing the eggs I will state that in 70 of the above 147 cases, where I have heard from the effect of treatment, in not a single case, did thymol fail to show the worms in the stool. Its occurrence in Iredell, Burke, Wilks counties, North Carolina, and in Sevier Co., Tennessee, would indicate that the clay counties are by no means immune. According to our observation, the cases are not as frequent, and not as severe as they are from Eastern Carolina. Add to these fifty-three students, seventy-one cases occurring in the practice of Dr. Nicholson, of Richlands, Onslow Co.; four cases for Dr. E. L. Cox, of Jacksonville, Onslow Co.; six cases for Dr. S. N. Harrell, of Tarboro, Edgecombe Co.; four cases for Dr. I. F. Hicks, of Dunn, Harriet Co.; one case for Dr. H. W. Lewis, of Jackson, Northampton Co.; one case for Dr. R. H. Speight of Wrendale, Edgecombe Co.; seven cases for Prof. Stevens, which he had collected from the State's prison, and we have 147 cases. From the 147 cases, etiological records have been obtained from 118 cases.

These records bear especially upon the relation of dirt eating, drinking water and ground itch to the disease.

Etiology.—This part of our subject naturally divides itself into two heads: First, a study of the anatomical and biological characteristics of the parasite, and secondly, its mode of entrance into the host. About the first we know much, about the second, little. And it is this very part of the etiology that concerns us most, for upon this knowledge will depend the rational and effective application of preventive measures. I shall consider the anatomy and biological characters first.

Anatomy of the Worm.—Dubini, of Milan, Italy, discovered the cause of the European type of the disease in 1843 and called it *Anchylostoma duodenale*, or *Uncinaria duodenalis.* In 1902, Dr. Charles Wardell Stiles, comparing worms collected from different countries noticed a difference in the American and European worms, thereby discovering a new species as a cause of the American form of the disease. This worm he has named *Uncinaria Americana.* This is a nematoid worm, a member of the family *Strongyloidæ*, whose members are characterized by the following points: Body cylindrical, rarely filiform; mouth in axis of body, dorsally or ventrally flexed, and surmounted by six cubical papillæ, four of which are submedian. Esophagus, more or less swollen posteriorly. Male presents a caudal bursa which may be complete or divided, and encloses one or two spicules. Female presents a vulva anterior or posterior to midline and two ovaries. This family is divided into two subfamilies and it is to the subfamily (*Strongylinæ*), the genus *Uncinaria* belongs. These are worms whose mouths are surrounded by a chitinous armature. Male presents a caudal bursa, with lateral and dorsolateral rays arising from a common base. Female presents two ovaries. Of the genera which compose the family, *Strongylinæ*, the genus *Uncinaria* is characterized by the dorsal flexure of its head, giving it a hook-like contour, from which it derives its name. Let us study the anatomy a little closer: Male, 6 to 9

mm. long; female, 8 to 11 mm. long; both about 4 mm. in thickness; color, white, or occasionally brown from contained blood; shape, head of male dorsally flexed, giving a hook-like contour, tail of male expanded, umbrella-like, tail of female conical.

Now to start at the head, we have a cup-like arrangement, measuring 100 μ anteroposteriorly, transversely and in depth. This cup is composed of four pieces, two curved quadrilateral plates incompletely united, ventrally and dorsally. Dorsally this incomplete union is strengthened by a dorsal reflection of the dorsomedium tooth, making the third of the four pieces, and the fourth piece exist in the form of a rim to the cup. This rim gives off on each side two lips, the two ventral are symmetrical semilunar-shaped and project well into the oral cavity. The two dorsal are rudimentary and only reach oval margin. Beneath these lips are six papillæ, three on each side, two beneath the ventral and one beneath the dorsal lip. The oral mucosa is reflected in folds to these papillæ, giving to the pharynx, when viewed from above downward a striated appearance. At the bottom of this cup begins the mouth proper. This is elliptical in shape and measures 50 to 70 μ anteroposteriorly and 40 to 50 μ transversely, but this shape is variable, as it is subject to muscular movements. Surrounding the margin of the mouth is a delicate transparent cuticle, continuous with the oval mucosa. Projecting into the base of the mouth is the esophagus with an armament worthy of description. This consists of a large tooth placed in a dorsomedian line, convex on its outward surface and concave on its inner surface. On each side of this dorsomedian tooth we have two sharp chitinous pointed lancets. The pair closest to the tooth are very sharp, point transversely and are known as the lateral lancets. The two more ventrically placed are more conical in shape, look backward and are known as the ventral lancets. These five structures are connected by a fold of oval mucous membrane so arranged as to leave a crescentic opening to the esophagus.

The esophagus is bottle-shaped, the large end posterior, measuring 750 μ in length by 160 μ in its thickest portion. It is composed for the most part of a thick muscular wall. Cut transversely, its opening appears triradiate posteriorly as it opens into the intestine, this opening is guarded by a valve. Lying along the esophagus are two glands, whose secretion is emptied just within the line of the ventral lancets. It is supposed that this secretion prevents the coagulation of the blood sucked out by the worm and is also supposed when absorbed by the host to exert a toxic effect. Now notice this effective blood-sucking arrangement. The muscular esophagus forces its pharyngeal portion into the chitinous cup, and the lancets and tooth now lie against the cup's walls. The esophagus retracts and more or less of a vacuum forms, the rim of the cup having previously been placed against the intestinal mucosa. Into this vacuum, the cup, this intestinal mucosa bulges in the form of a little pledget, which the large hook-like dorsal tooth catches in its return to its position and holds, while the lateral and ventral lancets play back and forth, continually wounding the delicate mucous membrane. This blood is kept fluid by the secretion of the two large glands above mentioned, sucked into the strong muscular esophagus, and emptied into the intestines. A return into the esophagus is prevented by a valve which guards its opening into the intestines.

Here we have an arrangement very much like a Davidson syringe. The intestine empties on the ventral surface of the female close to the tip of the tail. In the male it empties in common with the genital aperature, on the dorsal side of the conical papillæ within the caudal bursa. The worm is covered with a delicate transparent cuticle, laterally striated and this shows dorsal, ventral and lateral longitudinal markings. Beneath the skin is an encircling layer of muscularis with inward extensions for the support of the esophagus, intestines and genital organs. The generative organs in the male consist of two plicated tubular testicles lying along the intestine. These empty about the middle of the worm into a seminal sac, and this again empties by a duct on the dorsal side of the caudal nodule, through which passes a forked, barb-tipped penis about 9 mm. in length. The female generative organs consist of a vulva, placed anterior to the midline of the worm, and this is composed of two transverse folds. This vulva leads into a short vagina, which terminates in two uteri. These are tubular, one coursing posteriorly, the other anteriorly. The uteri terminate in two tubular ovaries, both of which coursing anteriorly, lie in plicated folds along the intestine.

The caudal bursa is so important in the differentiation of species, that it demands rather detail description. It is composed of an excess of cuticle, forming an umbrella-like expansion and this umbrella is held open by finger-like prolongation of the encircling muscular cord backward. These supporting muscular prolongations are called the caudal rays. The bursa is divided into two well-marked lateral lobes, a divided dorsal lobe and rudimentary ventral lobe. The dorsal ray arises by a common base with the dorsolateral ray, the dorsal ray going to the dorsal lobe, where it ends bipartite, the dorsolateral curving downward into the lateral lobe. The ventral ray is also bipartite and just within in its base we find a rudimentary subventral ray. The male uses this bursa in clasping the female *in coitu*. The thousands of eggs, deposited in the stools furnish the doctor with a diagnostic omen and the ignorant laity with a source of infection.

The description of the eggs is most important. They are oval, symmetrical in shape, measuring

68 by 38 μ in size, composed of a beautiful laminated transparent shell, enclosing a granular or segmented yolk. We never find the eggs enclosing an embryo in the fresh stool. The egg must develop outside of the body, and therefore, for every worm in the intestine the host must have swallowed a young uncinaria. These eggs, when exposed to a temperature of from 21° to 37° C., and kept in a semisolid stool, supplied with oxygen, hatch out into the rhabditiform embryo in about forty-eight hours. This hatching is delayed by too much moisture, lack of oxygen, or being kept in the dark. Drying destroys the eggs in twelve hours. In about three days after hatching the young worm reaches the second ecdysis. This worm lives well in water. This is the infective stage. After entering the host, it passes through other stages, until it finally develops into the mature parasite.

Let us now return to its mode of entrance into the host. This is important, for the preventive treatment depends upon a correct understanding of this point. Three possible routes of infection exist: (1) Taking the food contaminated with fecal matter, in other words dirt-eating; (2) through the drinking water; (3) through the skin in the lesions of ground itch. Let us study these portals of entrance a little more in detail.

The first, dirt-eating, we can readily understand. It is the simplest. Dr. Stiles seems to think it is the principal mode of infection. So much importance is attached to this view, the disease is known as dirt-eater's anemia, brickmaker's anemia, tunnel anemia, miner's anemia, etc., all occupations associated with soiled hands, and of course a certain amount of dirt-eating. Then we must not forget that dirt may get into the mouth on fresh vegetables, grown in the ground, such as water cress, celery, radishes, etc. Here it is necessary to keep in mind Allen J. Smith's caution, that all dirt-eaters are not predisposed to hookworm, for some dirt could not possible harbor the larvæ, such dirt as soot, ashes, brick and mortar. Again we should remember that dirt eating is often an effect and not a cause of anemia. Every clinician knows about the "longings" of pregnancy and anemic conditions for such things as clay, sand, etc.

Second Mode of Infection, Drinking Water.—As Dr. Stiles has pointed out and I have frequently verified, the eggs die or degenerate rapidly in water. So that if a stool was washed immediately after voiding into water, the eggs would rapidly perish. Not so if the stool is deposited on the ground for two or three days, until the eggs hatch out into the second stage. Now if a rain falls, the parasites are carried into a nearby stream, spring or surface well.

Loose has shown that these worms pass rapidly through sand filters, and that they will live thirty days in water. These larvæ, once in the water, sink to the bottom of the well; but the bucket also sinks, and could as easily bring up the young larvæ, as it does the grains of sand contained in nearly every bucket of water. Dr. Smith seems to think the wind plays a part in spreading the dry feces in the form of dust on the house tops, where the eggs can easily be washed down by the first rain into the cistern, and there develop; but experimental evidence proves that both the eggs and larvæ die rapidly on drying. So until it is proven, that the eggs can withstand drying, we can disregard the wind as a factor in spreading the disease.

Third, ground-itch, as a portal of entrance: we have purposely left this until the last, because we want to go more in detail here, as we believe it the principal portal of entrance in Eastern Carolina. What relation does ground-itch bear to uncinariasis? That is, we think, an important question to answer. Now, in considering this phase of our subject, the first question to present itself is this: Is ground-itch infectious? Here is the evidence derived from the articles of Elliott (?), of Assam, India, who gives clinical evidence, from Dalgetty, South Silhet, India, who furnishes clinical and experimental evidence, and, lastly, from Bentley, in South Africa, who gives experimental evidence, and all this answers the question in the affirmative.

In *The Journal of Tropical Medicine* for December, 1900, Elliott reports the clinical features of ground-itch, and in considering the cause arrives at the following conclusions: (1) The disease manifests itself from May until September, the largest number of cases occurring during the months of July, August and September; (2) It occurs after heavy rains, when the ground is moist and sticky; (3) it occurs only in those who go barefooted and expose themselves to the wet earth; (4) it does not occur at all, or only slightly, on new land; (5) cases are most numerous and severe in those who work about the lines where the ground is thoroughly manured. The frequency and severity of the cases seem to bear a close relation to the fecal content of the soil.

Then to produce ground-itch, we must have contact of the bare skin with fecal-contaminated soil, at a certain temperature and containing a certain amount of moisture. All of these five factors must be present, *i.e.,* (1) bare skin, (2) soil, (3) feces, (4) moisture, and (5) certain temperature. The first three of these conditions will not produce it. Ground with proper temperature, fecal contamination and bare skin will not produce it, else it would occur in April and May, when the ground is dry. Ground with requisite moisture and temperature does not cause it; if it did, it would not be so rare on new lands. It is not airborn or the Europeans would suffer alike with the natives. The Europeans wear shoes. We have here a mass of circumstantial evidence that points, first, to infection as a cause of ground-itch, and second, the infectious agent as derived from the human feces.

Assuming infection, what is the infectious agent? Do you notice any conformity of above conditions, *i.e.,* feces, temperature, moisture, etc.,

to the biological requirements of the hookworm? You certainly do.

Is it possible that these parasites produce ground-itch? Allow Bentley to answer: Having had his attention attracted to this possibility, by finding a rhabditiform in the lesions of the ground-itch, he performed the following experiments: He took two stools, one we will call "A" and the other "B." "A" was infected with the larval uncinaria. "B" was free from uncinaria. He then sterilized a mass of sand. Dividing this, he mixed part with stool "A" and part with stool "B." Now "A" was divided into two portions which we will call "a'" and "a''." "B" was likewise divided into "b'" and "b''." "a'" and "b''" were now exposed to the air for eight hours till dry. At this time all four portions were applied to the bare skin. "a'" produced an erythema exactly resembling that of ground-itch and on examining "a'" most of the worms had disappeared, only a few dead larvæ remaining. "a''" contained the original number of dead embryos. Of course these were killed by the eight hours' drying.

Dalgetty agrees with Elliott on the predisposing causes, viz., temperature, moisture, feces, etc., but differs with Bentley as to the exact cause. Dalgetty's work preceded Bentley's by two years. Dalgetty attributes ground-itch to the *Rhizoglyphus parasiticus,* a parasite closely resembling the itch mite; and its association with fecal material, he explains by saying that the parasite lives best on rich organic matter. We are not inclined to accept Dalgetty's theory as to the direct cause for these reasons: First, from his paper, his technic appears faulty. Second, he does not give the per cent. of cases, in which this parasite was present, a condition concerning which he would not have remained silent had he found any number of cases. Third, it fails to explain the association of ground-itch with fecal contamination of soil. It therefore seems very probable that ground-itch, as claimed by Bentley is an infectious dermatitis, due to the entrance of the larval *Uncinaria,* carrying in with them certain bacteria, which modify the lesions.

Assuming that ground-itch is due to infection with these larvæ, we may very properly ask: Does this cutaneous lesion bear any relation to the intestinal lesion? To answer this, we refer you first to Loose's experiments. Loose is a careful man, and his work is accepted by all authorities. His experiments were done as early as 1898. He examined the feces of two puppies, and assured himself that they were not infected with hookworms. He then shaved their backs, and applied to their bare skin a poultice composed of infected stools and charcoal. Both puppies died on the ninth day after the poultice was applied, and many young hookworms were found in their intestines, which corresponded in stage of development to young worms in another dog's intestine, which dog had been infected from the same stool from which the poultices were made. Then he performed the same experiment on a man. His stools were examined and found free from hookworm eggs. Then a poultice composed of feces with hookworm larvæ in them was applied to the back of the forearm. On the seventy-first day thereafter, the man showed hookworm eggs in his stools. This proof that uncinaria may enter through the skin, is accepted. It is not without analogy.

The weight of evidence goes to prove that this occurs in infection with the *Bilharzia hematobia,* where the parasites are found in the ureter, bladder and kidneys. But, you say, having entered, how do they locate in the intestine? We do not know how, but we know they do.

The selective affinity of various parasites for different tissues, is a well-recognized fact, and is accepted by all authorities. We have example of this selection an infection of the brain with *Cœnurus,* infection of the liver with *Ecchinococcus* or *Amœbæ,* infection of the muscles with *Trichinæ spiralis,* and lately an infection of the intestine with *Anchylostoma duodenale.*

The fact stands, and some day the explanation will follow. Now, assuming that the frequency is accepted, we believe you will all agree that the preventive treatment is the most important, for upon this will depend the extermination of the disease.

To effectually and rationally apply the prevention it is necessary to know the route of infection.

Of the above three routes of infection, *i.e.,* dirt-eating, drinking water and ground-itch, we think we can safely accept all as possible routes, and in applying our "ounce of preservation," all must receive due consideration. But which is the most important route? Which portal is the most accessible to the hookworm? To answer this question we have collected etiological records from 118 cases distributed as follows:

71 cases from Dr. J. L. Nicholson's practice, Richards, Onslow Co.
3 cases from Dr. Cox's practice, Jacksonville, Onslow Co.
4 cases from Dr. Hicks' practice, Dunn, Harriet Co.
4 cases from Dr. Harrell's practice, Tarboro, Edgecombe Co., and
35 cases from Wake Forest students.

Race.—All of the 118 cases were white. We could not find a single case in the negro, although Dr. Nicholson's practice is in a country, where about one-half the population are negroes. Considerable trouble was taken to find it in the negro. Only one negro was encountered who presented suspicious symptoms. Microscopical and thymol test were both negative. Some have held that this relative immunity of the negroes was only apparent and not real, that the prominent symptom of uncinariasis, pallor, was absent on account of the negro's color. This is a mistake, for not only is the pallor absent, but the other symptoms of uncinariasis as well. It is there-

fore our experience that the negro is partially immune. He is, however, as susceptible to ground-itch as the white.

Sex.—Of course the students were all males and in considering the influence of sex should not be taken into count. Of the other 82 cases, 47 were males and 35 females.

Residence.—Of the 118 cases, 109 lived in the country, nine in town, but this includes 71 cases from Dr. Nicholson's practice, all of which were from the country. It is not right to consider these in the etiological bearing of residence. We shall therefore only consider the bearing of the 35 students on this point. All of these students except seven were from the country. These seven, with the exception of two, were from mere villages, and all 35 had lived in the country at some period of life.

Soil.—It is most frequent on a soil composed of an upper layer of fine, gray, compact sand, with a substrata of clay about six or ten inches below the surface. Another soil that seems favorable is the loamy, fine, sandy soil, *i.e.*, a fine sand mixed with much decaying vegetable matter. Here we may have no clay subsoil. It has been interesting to observe its almost entire absence on a soil made up of coarse sand, six or eight feet deep. We account for this distribution on the biological requirements of the parasite. On the first two of the above soils, you have a structure to hold moisture, on the last, rapid drying and death of the parasite.

Occupation.—117 worked on farms, one worked in a cotton mill, but had lived on a farm.

Age.—The youngest patient, two years and four months old; the oldest patient, fifty-six years; two were fifty years old. The students ranged from seventeen to thirty years, 12 were under and 18 between twenty and twenty-five years, making 30 of the 36 patients under twenty-five years of age.

Under five years there were	5 cases
Between fifth and tenth year	14 cases
Between tenth and fifteenth year	28 cases
Between fifteenth and twentieth year	15 cases
Between twentieth and twenty-fifth year	9 cases
Between twenty-fifth and thirtieth year	2 cases
Between thirtieth and thirty-fifth year	4 cases
Between thirty-fifth and fortieth year	1 case
Between fortieth and forty-fifth year	0
Between forty-fifth and fiftieth year	3 cases
Between fiftieth and fifty-fifth year	0
Between fifty-fifth and sixtieth year	1 case

Average age of onset seven and one-half years.

Under ten years of age, 70 per cent of our cases were infected.

Family Disease.—Of 70 cases in Dr. Nicholson's practice, 39 families were represented. These families number a total membership of 280. Of the 280, 32 per cent. have been microscopically diagnosed, and 25 of the remainder clinically diagnosed uncinariasis. Again it has been noted that it seems to be a family trouble generation after generation. Furthermore the large number of aggravated cases, seen in certain families, would seem to indicate that prolonged and intimate association upon a soil intensely contaminated an etiological factor of great importance.

Dirt-Eating.—Of the 36 students, three admitted dirt-eating, two ate parched coffee, and 31 denied dirt-eating. Of the 82 mixed cases, 64 denied dirt-eating, eight confessed, five chewed rosin, two chewed rags, two chewed sticks and two chewed coffee. A close study of our cases does not encourage us to attach much importance to dirt-eating as a source of infection. And by dirt-eating, we mean putting anything in the mouth contaminated with feces, either the soiled hands, fresh vegetables, as celery, water cress, etc., or the soil itself.

Drinking Water.—All of our cases show a questionable water supply. Those from Eastern Carolina, drank from surface wells, varying from six to 25 feet in depth. Many of these wells were uncurbed and uncovered. Our Western cases from the mountainous country drank from springs. And as it is a custom on farms, both western and eastern cases occasionally drank from creeks, while out at work. Notwithstanding this questionable water supply and Loose's demonstration, that the larvæ pass rapidly through sand filters, and live well in water for at least thirty days, we are not inclined from a study of our cases to attach much importance to drinking water, as a source of infection. Like dirt-eating, we believe it a probable source, and possibly accounts for the scattered cases or the light cases, and those which develop without a preceding attack of ground-itch. Our reasons for this view are, (1) If it is due to drinking water why should children be more often infected than adults? They drink less water, and therefore would not be so much exposed to contagion as the adult. Our statistics show that 70 per cent. of the cases begin before the tenth year. (2) If it is true, as has been suggested by some authorities, that it is due to the careless drinking of water from springs and creeks, then it should occur principally in males, and be more frequent after the fifteenth year, for it is not until this age that the child begins to work away from the house on the farm. (3) Again, here is a careful observation that opposes the water theory of infection. The tenant classes usually move every year or two to a new farm; they usually move in the winter. The ground is sterilized by the frost and snow. A new tenant moves in, and if the well is the source of infection, you would suspect the new family to become victims. This does not usually follow unless the new family have the same unclean habits as their predecessors.

Ground-Itch.—Every case, except one, gave history of ground-itch. This exception was a case from Iredell Co., who said he did not know what ground-itch was. Admitted that he had suffered with dew-crack. Now the above etiological data when considered together would seem to justify the conclusions, ***that the mass of***

evidence favors ground-itch as the most important factor in the transmission of the hookworm disease, and that while drinking water and dirt-eating are predisposing factors, they are not so important as ground-itch.

What are the grounds for such a conclusion?

1. It has been noted that in localities where ground-itch is frequent, there hookworm disease is also frequent. Where there is no ground-itch, there is little or no hookworm disease.

2. Then over 99.5 per cent. of 150 cases gave a history of ground-itch. If we accept Bentley's theory of ground-itch, *i.e.,* a dermatitis due to the carrying in of bacteria by the entrance of hookworm larvæ, and not to the larvæ themselves, we can then explain those cases without ground-itch as due to larvæ entering with only a few bacteria or non-virulent bacteria. In other words, the question is whether these larvæ can enter without producing a local lesion, as suggested. Probably a better explanation of the cases without ground-itch, is that they were infected though water or dirt-eating.

3. In 69 out of 90 cases, the history was that ground-itch preceded the development of the other symptoms. In 18 cases, the patients could not be sure about this point.

4. We have noticed that in the majority of cases, the severity and number of attacks of ground-itch bear a definite relation to the severity of uncinariasis. Severest cases give a history of severest ground-itch.

5. The age of our patients affords valuable information. A glance at the age table impresses one at once, that the disease is definitely associated with the period of life when the child goes barefooted. It does not occur, except rarely, under three years of age, for until then the child runs about but little, and then indoors, and it is not allowed to run about after rains until the ground is dry. From this age, one will observe a definite and steady increase until the fifteenth year, when there is a decline. This corresponds to the period of greatest activity of barefooted children. In the South, these children begin to wear shoes all the year round at the ages of thirteen to fifteen years. Cases are comparatively uncommon beyond the twenty-fifth year; rare beyond thirty, and when they do occur, are light and nearly always on the decline. Among the students, the disease was light and on the decline. This was because these men had been wearing shoes the year round for the last five to ten years. Here is an interesting observation, bearing on the association of barefootedness with uncinariasis. Of my 53 students, 36 were treated with thymol and the number accurately counted after the method of Allen J. Smith in the November, 1903, number of *The American Journal of the Medical Sciences.*

The average number of worms passed was 20 in 35 of the cases. These men had ceased to go bare-footed at the age of twelve to fourteen years. There were six men from Sampson Co., who went barefooted in the summer until seventeen to twenty-four years, this being a peculiarity of these men. They were given the same treatment as the others, but passed an average of 113 worms. The number passed by these six men were 350, 120, 100, 68, 32 and 10. In our cases we have frequently noticed this association. Our severe cases, beyond twenty years of age, are in those who have gone barefooted much of their lives.

6. As pointed out above, it is a family disease. Occasionally we have single cases in a large family. This case for instance; a child twelve years old, a member of a family of eight children, was the only one affected. An intelligent mother affirms that she is the only child who ever suffered with ground-itch.

7. We have observed, what may be termed acute uncinariasis. To illustrate we give as an example, G. S. N., aged nine years, male. Healthy all his life. September, 1903, a very severe attack of ground-itch, could not walk and had to remain from school. This attack lasted one month. Latter part of October and early November began to show anemia, poor appetite, listless, headache and diarrhea. These symptoms continued, increasing in severity until December; he presented on inspection a picture of chronic parenchymatous nephritis. Stools were examined microscopically. Many *Uncinaria* eggs were present. Thymol was used, a large number of worms were expelled, the anemia treated, and complete recovery followed.

We have four more similar cases, where there is one severe attack; it may be the only one ever suffered from, and this is followed in from six to eight weeks by rapid and profound anemia, which yields promptly to thymol and iron.

8. When the patient ceases to be troubled with ground-itch, it is the rule for improvement to begin. Age table shows this.

9. Allow us to offer one more point in favor of ground-itch as a cause, at the same time reporting the youngest case on record.

A baby, two years four months old, a member of a family of six children. The mother and the other five children have been microscopically diagnosed uncinariasis. This family lives in a log cabin on a *dirt floor.* In the summer, when this child was seventeen months old, the mother and the other children assisted a neighbor to "hang tobacco" a little way from her cabin. The baby was left at home on the dirt floor. In a very short time the baby suffered with three attacks, of what the mother calls "mad-itch," over the buttocks and posterior thighs. Up to this time the baby was red-faced and healthy. Now there started a decline, so that when this case was seen, last month, it was one of the most distressing and well-marked cases of uncinariasis that has come to our notice.

In conclusion, allow us to ask this question: If drinking water and dirt-eating are responsible for the majority of cases, as Dr. Smith and Dr.

Stiles would seem to favor, why does it occur so rarely under three years of age? For who gets more dirt than the baby, and why should it harbor other intestinal worms more frequently than any one else, yet fail to show hookworms? And if drinking water is such a causative factor, why should it be more frequent in children, who drink less water than adults?

We therefore conclude, *concerning the etiology of hookworm disease, that ground-itch is by far the most important portal of infection, and that dirt-eating and contaminated water supply, while capable of infecting, are not nearly so important as ground-itch as a source of infection.*

A CASE OF PNEUMOMELANOSIS.

BY FRANK I. GIVEN, M.D.,
OF HILLSBORO, NEW MEXICO.

JOHN RYAN, age fifty years, of Irish descent, occupation gold and copper miner. Began to lose strength and flesh and develop cough about 1898. Did not become incapacitated for the purusit of his vocation until about 1900. Had been a hard drinker for years.

Physical Examination, January 8, 1904.—The chest seemed abnormally large, measuring 48 inches at the fourth rib. Expansion one-half inch. Percussion note flatter than normal over the entire pulmonary area, excepting at the apices where it became slightly tympanitic. Moist bronchial râles over the trachea and bronchi. Bronchovesicular respiration over the lower lobes, the vesicular quality gradually diminishing toward the apices where the sound became blowing in character. Vocal resonance and fremitus were negative as far as any aid to diagnosis was concerned.

The heart's action was feeble, but there was no indication of organic trouble. Abdominal organs were normal. There was present a comparatively scanty expectoration of a jet black sputum about the consistency of that of ordinary phthisis. At times there was present in the sputum particles of calcareous material varying in size from that of a grain of rice to fine grit. Death occurred January 13, 1904.

Autopsy Eight Hours Later.—Body very much emaciated. Skin dry and scaley. Several hemorrhagic petechiæ on the extremities but none elsewhere.

Heart.—Atrophied. Heart muscle very friable. About one ounce of liquid in the pericardium.

Lungs.—Both about one-fourth larger than usual. More firm at the touch than normal. Mottled black and pink in appearance, black predominating. Numerous extensive and strong adhesions at the apices. So strong were these adhesions that both apices were torn off on removal. The upper three fourths of both upper lobes were jet black in color, externally as well as on section. Cavities were present in both apices, irregular in outline, that in the left apex being the larger. Projecting into the cavities were numerous calcareous bodies. Cutting through the upper lobes was like cutting through a bag of gravel. The cavities and bronchial tubes leading from them were filled with a jet black sticky material resembling the sputum during life. The lower lobes were mottled in appearance both externally and on section, resembling in appearance a section of sausage, only the colors were black and pink, the black largely predominating. Several grayish puckered areas were noted on the surface of the lungs resembling cicatrices. These places on section were invariably found to contain calcareous material jet black in color. The mediastina contained many enlarged hard (like cartilage) jet black lymph glands. There were about two ounces of liquid in the pleural cavities.

Liver.—The right lobe was slightly enlarged. No pigmentation either externally or on section. A few small black glands were noted in the folds of the peritoneum beneath the liver.

Spleen.—Slightly enlarged, but in not sense melanotic.

Stomach.—Atrophied; mucous membrane covered with mucopurulent secretion. Several hard black lymph-glands were seen along both the upper and lower borders of the stomach.

Pancreas.—Normal.

Kidneys.—Right, normal; left, movable over a radius of our inches; otherwise normal.

No black lymph glands were discovered below the region of the stomach.

Brain and osteomyelon not examined

Diagnosis.—Pneumomelanosis with tuberculosis complication.

MEDICAL PROGRESS.

MEDICINE.

Theory of Alkaptonuria.—An important observation made in that peculiar chemical malformation known as alkaptonuria, is that homogentisic acid when given by mouth is excreted as such, while the normal organism can still further decompose it. In the experiments of W. FALTA (*Deutsch. Arch. f. klin. Med.*, Vol. 81, Nos. 3 and 4), almost the entire quantity ingested could be recovered from the urine. The only other instance in which the acid could be detected in the urine was in a severe case of diabetes with absolute intolerance toward carbohydrates, for soon after the patient had taken four grams of homogentisic acid the brown color of his urine was very noticeable. In plants, tyrosin and phenylalanin are decomposed with the intermediary formation of hemogentisic acid, and the same process probably goes on in every normal animal body. With alkaptonuria, however, there is an inability on the part of the system to break up the benzol ring of the acid into simpler principles (urea, carbon dioxide and water). Little is known as to how the tyrosin and phenylalanin molecules of albumin are absorbed under normal conditions, but it seems probable that most of the tyrosin is split off in the intestines and absorbed as such while phenylalanin is absorbed as constituent of a more complex molecule. It is certain, however, that homogentisic acid is formed very soon from both. The metabolic

activity of the alkaptonuric is not abnormal with reference to the breaking down of the other constituents of the proteid molecule, and it is possible for him to remain in perfect health, despite his abnormality.

Changes in Nails in Scarlet.—Attention is directed to a new postscarlatinal symptom by E. FEER (*Münch. med. Woch.*, October 4, 1904). Four to five weeks after the onset of scarlet, at a time when desquamation is nearly completed, a transverse furrow or a distinct elevation will appear upon the root of the nails of the fingers, particularly the thumbs. As the nail grows, this furrow will advance, until at the end of five or six months it has reached the free surface. The prominence of the line is generally in direct proportion to the intensity of the eruption, and in very young children there may be difficulty in finding it. In a small percentage of cases of measles a less prominent line may also be detected, but not in other diseases. By the position of the line, it may be possible to state at what time the patient suffered from his scarlet and the scarlatinal origin of a nephritis or a rheumatism may thus be settled.

Insanity and Epilepsy in Relation to Life Insurance.—It will not be long before the great insurance companies are in possession of more reliable data bearing on the relation of certain diseases for the shortening of life than are to be found elsewhere in the archives of the medical profession. W. R. GOWERS (*Lancet*, October 15, 1904), in an address delivered before the Association of Life Assurance medical officers, October 5, 1904, basing his remarks in part upon the medical experience of Dr. Claude Muirhead, from 1874 to 1894, in his experience with the Scottish Widows' Fund, in part upon his own personal observations, he said that the first practical question to be asked in the matter was whether or not any actually insane person should be considered a justifiable risk under any conditions. He believes that the answer to this is a qualified "yes." Obviously no one suffering from acute mania or melancholia can rightly be looked upon as insurable. The pitfall of making sweeping conclusions from single isolated cases had been avoided too conscientiously. Such cases have occasionally a very marked value, and he cited one in which the company made the largest relative profit of any case that it had done under the author's observation. A man, twenty-eight years of age, was insured in 1830, after he had been a resident of an asylum for twelve years. He died sixty years later, the diagnosis in the case being imbecility in consequence of epilepsy in early life. The profits on this case were $230,000 for the insurance company. Chronic imbecility, if not attended with deterioration of the vital organs, is not to be rated among afflictions which shorten life. Of the two types of idiots, the congenital and acquired, of which latter form this man was an example, Gowers believes that the acquired form is by far the better risk. Certain cases of paranoia, in which the delusions had become fixed, not only in type but in extent, are also good risks. Suicide is a factor with which insurance companies have to deal widely. It is apt to be much higher in the insane than in the sane. In Dr. Muirhead's 9,000 deaths, 127 were due to suicide. Insane heredity, curiously enough, does not seem to have any greater bearing upon suicidal probability than an ordinary neurotic family history. The conclusion of the author in regard to the bearing of family history insanity on a given risk, whose physical and mental condition at the time of examination is good, should not count for anything. The average age of 40 epileptics on entry was thirty-two years, and at exit by death forty-eight years. In only one case was there any hereditary history worth paying any attention to. Many of the cases insured by this fund probably suffered from so-called nocturnal epilepsy. Probably the chances after twenty years of age that a child of epileptic parentage will suffer from the disease are about one in fifty. When to this small ratio is added the fact that epilepsy tends to shorten life in but small degree it does not seem that family history should be entitled to any consideration whatsoever. It is different, however, with individuals in whom the disease has actually developed. Are they insurable? Frequent attacks of epilepsy should probably bar the case absolutely from insurability. Occasional attacks, however, in patients who have passed middle life, may, in chosen cases, be regarded as not constituting insuperable objections.

True or Inoculated Rabies.—Under this title a case is reported by L. HEYDENREICH (*Berl. klin. Woch.*, September 19, 1904) in which a doubt existed as to whether the symptoms were due to the bite of the rabid dog or to the preventive inoculations. A woman, aged forty-five years, was bitten by a young dog, which was almost immediately killed without having given any evidences of having had rabies. The patient was given Pasteur treatment, 24 injections being made within twelve days, beginning five days after the injury. On the eighth day of treatment, a series of symptoms came on, regarding which it was doubtful whether they were due to true rabies or the inoculated modified form,—malaise, nausea, slight cerebral disturbance and stupor. These increased in severity and were accompanied by obstinate constipation, paralysis of the bladder, dyspnea, mental depression, with paresis of the face, tongue and pharynx. Gradual improvement came on after a month, but then she became melancholic and finally a complete idiot, dying within ten months after the injury. It seems probable that in this case the symptoms were due to the inoculations, for the disease began to show itself within thirteen days after the bite, which is unusually early, particularly as the injury was very superficial. Another servant in the same house was more severely bitten by the same dog, but was not treated and remained perfectly well. The dog in all probability was not mad. The case is of interest because the symptoms could be traced without much question to the inoculations, and the production of such a modified form of the disease has usually been ascribed by other authors who have observed it to the character of the bite itself. The author thinks that if the treatment had been continued, so that a true immuniy was developed, the woman might have been saved.

SURGERY.

Treatment of Ununited Fracture of Neck of Femur.—It is not at all uncommon to encounter patients, either in full activity or only slightly past adult life, upon whom the most exacting limitations have been placed by this sequel of fracture. LEONARD FREEMAN (*Annals of Surgery*, October, 1904) states that it is extraordinary, in view of the excellent results obtainable from the open operation, that so few cases are to be found recorded in the literature of the subject. It may be one reason for the limitations on the operation is that most of the patients are very elderly, and are obviously unfit for surgical intervention. The technic of the operation centers chiefly on two points, viz., the position of the incision and the method of uniting the fragments. There can be little doubt that the anterior incision is to be much preferred to the posterior. It

should begin just below and external to the anterior superior iliac spine. It will thus lie between the sartorius and the fascia lata. The removal of the soft parts interposing between the fragments must be thorough. By the time the patient is operated on, this tissue has usually become well organized and may be highly vascular. The fixation of the fragment is the most difficult problem. One of the most important points in accomplishing this lies in securing the support of the trochanter from behind. While extension, combined with this support, will, in many cases, give excellent results, it is probably safer not to trust to these alone. Nails, screws or bone or ivory pegs may be inserted obliquely either through the original incision or through a small opening over the trochanter. These appliances, however, because of the extreme porosity of the bone, often do not hold it in place at all adequately. For this reason Parkhill suggested the use of his bone clamp. The author has devised a clamp, the efficiency of which lies in the fact that the screws bury themselves as firmly as if screwed directly into the bone. The question when to remove the supports is a difficult one. If infection occur, they should be taken out at once. In the author's own case, there was evidence of sepsis at the end of two weeks, but perfect drainage and subsidence of symptoms resulted from a removal of the screws. The majority of operators have placed the time for staying in bed at ten weeks. This is probably the minimum, because of the well-known osteoporosis, which almost invariably affects the region of the femur in these sequels of fracture of the neck.

Meckel's Diverticulum.—This interesting but inconstant remnant occurs not infrequently within the sac of external herniæ. FRANK E. BUNTS (*Annals of Surgery*, October, 1904) states that although the credit must be given to Johann Friederich Meckel for having called general attention to the organ, as well as for his well-known classical essay describing it, Lavater is said to have been the first to have recorded observations upon it. Ruysh in 1701 called attention to this abnormal development, which he described and illustrated in his "Thesorus Anatomicus." Morgagni in his "Seats and Causes of Disease," reports several cases of Meckel's diverticulum. It was Meckel, however, who advanced the theory that it represented the remains of the omphalomesenteric duct. While this origin of the diverticulum is generally believed, there are those who consider that it arises from the vitello-intestinal duct, and claim that it is developed as the result of traction upon the intestines by the omphalomesenteric duct. Disconnection between the duct and the gut should take place at about the third month. Rolleston has found it in 3 57-100 per cent., Osler in 2 per cent. Mitchell found it in 39 cases out of 1,635 patients examined. It is considerably more frequent in the male, only four women having occurred in Mitchell's 39 cases. It is usually present in the lower fourth of the ileum. It does not appear, however, that it is restricted with any great degree of positiveness to any particular portion of the alimentary tract, for it may be located anywhere between the esophagus and the ileocecal valve. This variation in position is explained on developmental lines. The loop from which the lower part of the duodenum, the cecum and colon are developed, is usually U-shaped. At the point of greatest convexity the duct is attached. The great length of the small gut, which subsequently develops from the upper limb of this flexure, usually places the duct in a position near the valve. Very slight variation, however, in point of attachment of the duct to the loop will at term place the duct in very widely varying positions. The length of the duct varies from a small blunt projection to a diverticulum ten inches in length. It is usually tubular, resembling the finger of a glove. The diameter is often nearly equal to that of the gut itself. Indeed Stillman states that it may exceed it. The author reports the history of a male who, presenting exidences of an ordinary strangulated inguinal hernia, was found on operation to have within the sac a strangulated Meckel's diverticulum. As it was evidently gangrenous, he resected ten centimeters of the intestine on either side and united the ends by a Murphy button. The recovery was uneventful, except that when the patient left the hospital two months later, the button had not passed.

Intestinal Exclusion.—The definition of this procedure is as follows: The term means the rendering inactive any part of the intestinal canal by surgical means. B. G. A. MOYNIHAN (*Lancet*, October, 1904) states that examples of this exclusion are to be seen when entero-anastomosis is performed. When the intestine is cut across, the distal end closed and the proximal end united to the side of the distal. The following forms of intestinal exclusion are recognized: Entero-anastomosis of Maisonneuve; entero-anastomosis with constriction by suture of the part distal to the upper opening. Unilateral exclusion, when the gut is divided completely across and the proximal end is implanted into the side of the distal. Bilateral exclusion, when the bowel is divided at two places and the intestinal channel is restored, leaving a segment of the bowel detached. Of this segment one end may be left open and stitched to the skin, or both ends may be closed when a fistula exists in the bowel lying between them. The operation may be called for under the following conditions: Tuberculosis or simple ulcers of the intestine which have led to the formation of external fistulæ. In intestinovaginal fistula following hysterectomy, a bilateral exclusion is performed and the sequestrated loop drains into the vagina. In cholecystenterostomy, the gall-bladder is joined to the portion of the bowel cut off by unilateral exclusion. Unilateral exclusion, except in cases of disease, affecting the lower end of the ileum, offers no advantages over lateral anastomosis.

Sterilization of Rubber Gloves.—Washing rubber gloves with hot water and soap for four minutes will not disinfect them, according to the many experiments of D. FROMME and J. GAWRONSKY (*Münch. med. Woch.*, October 4, 1904). If, however, they are first washed in soap and water and then placed for two minutes in a sublimate solution, germs could never be found on the surface. It is perfectly safe to use the same gloves first for a septic and then an aseptic operation, provided they have no holes and the above precautions are followed. Likewise, it is not necessary to sterilize the gloves at home, since washing them on the hands directly before the operation will be perfectly sufficient.

A Predisposing Cause for Appendicitis.—The following combination of intestinal conditions is responsible for the occurrence of this disease, according to G. RUBIN (*Jour. Am. Med. Ass'n*, October 29, 1904). The accumulation of gases below the ileocecal valve and their voluntary retention, the ensuing distention of the cecum and dilatation in various degrees of the cecoappendicular orifice, the entrance into the appendix of larger fecal masses than are readily expelled, the interference with the vascular circulation and resulting erosion of the mucosa of the appendix with subsequent infection. The author made some experiments with a view of corroborating the theory proposed. Portions of bowel about 50 c.c. long, including cecum and appen-

dix, where resected in cadavers of persons dead from diseases other than would affect that part of the intestinal tract. After cleansing the bowel, the colonic end was ligated, small shot, peas and beans were introduced through the ileum end and the bowel manipulated so as to imitate peristalsis. It was observed that none of the bodies entered the appendical cavity, although the appendix was held at the most pendant point. Then the bowel, still containing these materials, was inflated, and the same process of rolling repeated, with the result that in all the experiments, with one exception, the appendix was filled with shot, and in two cases peas of medium size also gained entrance. During the process of inflation, the appendix was also ballooned out, and it is reasonable to suppose that a similar phenomenon might occur in the living subject.

The Early Treatment of Clubfoot.—Most writers on this subject advise beginning treatment as early as possible, at birth or soon after. V. P. GIBNEY (*Am. Med.*, October 29, 1904) differs from this view and doubts the advisability of instituting treatment at this early stage, and prefers waiting until the child is able to walk. Appreciating the ossification periods and all the arguments advanced in favor of early treatment, yet he is not convinced that enough is gained to justify the continued interference with the nutrition of the child at the time when every effort must be directed to perfect the infant feeding and hygiene. The excoriations, strained tendons and ligaments must surely inhibit digestion, and if digestion is inhibited, nutrition cannot satisfactorily proceed. Although he declines to treat clubfoot in young infants until they are able to walk, he does not infer that nothing ought to be done during the first eighteen months. The severe forms of treatment should be mitigated, as it is well known that a large number of cases of moderately high degree are corrected by the hand of the mother. This good work should merely be supplemented by simpler forms of apparatus.

Surgical Reflections on the Diagnosis of Cancer of the Stomach.—A. G. GERSTER (*Medical Record*, October 29, 1904), appeals to general practitioners to take earlier action in case in which the suspicion of gastric carcinoma seems justified. While it is true that the technic of the excision of gastric cancer has been developed to such a degree that the mortality in the hands of some operators, such as Mayo, has been reduced to about eighteen per cent., in the direction of early diagnosis much less progress has been made. We are furthermore confronted by the dilemma that if we wait until the diagnosis is reasonably certain, especially if we delay till a palpable tumor exists, it is too late to expect cure from operation. A reliable diagnosis of cancer of the stomach in the incipient stage, in which it is susceptible of successful operative treatment, is with our present knowledge a sheer impossibility, and therefore in the case in question we must make up our minds to submit the patient to the risk of an operation before the diagnosis is firmly established. The author concludes that when in a clearly progressive case of an intractable disorder of the stomach the local and general symptoms, conscientiously collected and weighed, strongly justify the suspicion of cancer, diagnostic laparotomy should be considered not only admissible, but obligatory.

THERAPEUTICS.

Natural Mineral Waters.—It has been recognized that no chemical analysis, no matter how refined or exhaustive, can determine the exact nature of natural mineral waters, and hence it may be assumed that no artificial mineral water can ever exactly reproduce the true natural water. Years of chemical experience has shown SPRIGGE (*Lancet* Vol. V, No. 4196, 1904, p. 323) that the therapeutic results cannot be duplicated any more than the water itself be manufactured. In a series of investigations conducted in these natural mineral waters, more particularly with Apollinaris, the suggestion is made that these therapeutic differences may in part be due to minute traces of radio-active salts, which are present in many of these natural waters. High pressure and high heat in the bowels of the earth are factors that cannot be reproduced in the chemical laboratory.

Treatment of Exophthalmic Goiter.—Drug treatment for this condition having been practically exhausted, there remains for discussion the surgical treatment, which is divided into the hemisection of the gland and into section of the cervical sympathetic, and the less generally recognized serum treatment. GEORGE R. MURRAY (*Lancet*, August 27, 1904) believes that as there is no good reason for considering that Graves' disease is infective in origin, there can be no good reason why a satisfactory antiserum should not be obtainable. Rather than to prepare the serum by the method of Möbius and Portis, Murray has resorted to the simpler means of feeding rabbits on thyroid extract. He uses ordinary rabbits or Belgian hares. In a series of sera, with which he obtained admirable results, the animals were given an average of seven minims of liquor thyroidei a day from October 18 until November 20. The serum was decanted and carbolized, and the two following cases of exophthalmic goiter were treated with it: The first was a very marked example of the disease, and the patient had been subjected to every known form of treatment, including Möbius' antithyroid serum. None of these had helped her. Under Murray's serum, however, she gained in weight, and the symptoms, which had been very aggravated, became greatly mitigated. The author, however, states that it is not impossible to account for the increase in weight and general improvement from the simple fact that the patient was in the hospital. The second case was that of a girl, nineteen years of age. The serum was given for three weeks. A moderate degree of improvement was noted, so that the author was led to the conclusion that if larger animals were used, this means of preparing sera would undoubtedly be of service, especially in the treatment of very acute cases.

Quinine by Injection.—The treatment of malarial fever by the hypodermic injection of quinine has been recommended by Manson, but rarely employed. A report of its use in 18 cases is made by C. M. FLEURY (*Jour. Royal Army Med. Corps*, October, 1904). He found the most suitable preparation to be "quininæ hydrochloricum acidum" of the B. P. It was readily soluble in warm distilled water,—1 minim of water taking up 1 grain of quinine. This preparation was non-irritating. He injected the solution deep into the structures below the ribs on the left side, getting in this way near to the spleen. The amount given was usually 8 grains, but in severe cases 16 were given without any bad effects. The results in almost every case were striking, and where no reaction followed the injection, it was found that the patient was suffering from some disease other than malarial fever. The cases treated

were those who had been residing in India for some time and had constant attacks of fever which failed to respond to the administration of quinine by mouth. The author claims that this is an easy and rapid method of cure, there is no headache, no buzzing in the ears, and the disease is cut short; in only a few instances were more than two injections required.

PATHOLOGY AND BACTERIOLOGY.

Vital Staining of Blood.—A new and superior method of staining blood and demonstrating some of the more delicate structures, has been discovered by H. ROSIN and E. BIBERGEIL (*Zeitsch. f. klin Med.*, Vol. 54, Nos. 3 and 4). An alcoholic solution of an anilin dye is spread over a cover-slip with the edge of a second cover-slip so that a thin, uniform layer is obtained. When dry, a small drop of blood is spread out over the dye in the same manner and then transferred while still moist over the chamber of a hanging-drop slide and the edges hermetically sealed with vaselin. This method enables examination of the blood in very thin layer while still in a fresh or vital condition, and since no other fluid is added, the elements will preserve their shape for weeks. After twenty-four hours the erythrocytes still appear as in the fresh specimen, and after eight days the majority have undergone no change. In the second week the hemoglobin will slowly begin to dissolve. The above applies to normal and chlorotic blood, but in severe secondary or pernicious anemia a disintegration is noticed as early as the second or third day. Acid dyes attach the cells more readily than basic dyes, though eosin is generally well tolerated. Polychromatophilia is well seen, the blue dyes, such as methylene blue and methylene azur being especially well suited. It is generally stated that basophile granulation occurs only in certain pathological conditions, but by the author's method every tenth red cell approximately contains granules which are, however, more delicate than those seen with lead poisoning, etc. There is still considerable dispute as to whether the granules denote degeneration of the protoplasm or disintegration of the nucleus, but the former explanation is more probable, since a mixture of methyl green (three parts of the saturated alcoholic solution) and neutral red (two parts of the saturated alcoholic solution) applied as described above, will stain the nuclei green and the granules red. In older preparations the cell itself has often disappeared so that the granules occur free, while in leucemia the intact, extruded nucleus can often be seen. Both elements retain their behavior toward special stains even in this condition, so that it is difficult to speak of any connection between the two. In fresh specimens of blood the ameboid movement of blood platelets is very evident and an increase in number marked in leucemia. In the stained condition they present a slightly granular center and a colorless protoplasm. The latter soon swells up and forms round or oval rings, leaving behind the center in an excentric position. With eosin and methylene blue the center stains blue and exhibits red granules, which tend toward the periphery. It is probable that he platelets form independent elements of the blood which are not derived from either red or white blood cells, and which stand in intimate relation to coagulation. Similar researches on white cells are promised in a further article. A full bibliography on hematology is appended to the article.

Iodine Reaction of the Blood.—The demonstration of glycogen in the blood has been modified by A. HIRSCHBERG (*Zeitsch f. klin. Med.*, Vol. 54, Nos. 3 and 4) as follows: A thin, uniform smear of blood is made upon a cover-slip and then placed while still moist upon the hollow of a hanging-drop slide containing a small crystal of iodine. The edges are hermetically sealed with vaselin, and the preparation then examined with the oil-immersion lens. In normal blood intracellular glycogen is occasionally found, but extracellular granules are more common and have no diagnostic importance. They are said to be increased in fractures, diabetes and severe anemia, but this is certainly not constant. In catarrhal jaundice small yellow platelets are occasionally seen which are probably blood platelets containing glycogen. The erythrocytes always contain diffuse glycogen, since they stain brown with the new method granules are never found. The intracellular granules of leucocytes never invade the nucleus but often lie grouped about it in the protoplasm. The multinuclear leucocytes are most often affected, and the statement that most cells are especially rich in glycogen is certainly not justified. All attempts to stain iodized blood films, particularly with neutral red, failed, since the iodine vapors fix the blood before the dye has had time to stain the nucleus. With the new method, positive results are often obtained where the older ones fail completely. Some doubt has recently been expressed as to whether the substance in question is readily glycogen, but the reaction toward iodine, the negative behavior toward specific dyes for amyloid, such as methylviolet and the resemblance in structure to the granules of glycogen contained in liver cells, remove all doubt. The reason why glycogen is found more frequently with infection and intoxication is because it is here changed into a less soluble form, so that it resists the action of solvents. The injection of albumin, peptone and carbohydrate, aseptic suppuration, indeed every process accompanied by emigration of the leucocytes, will have the same affect. In the hematopoietic organs, glycogen is also encountered frequently in health with the new method.

Blood-platelets in Human Blood.—The following method is recommended by E. HELDER (*Deutsch. Arch. f. klin. Med.*, Vol. 81, Nos. 3 and 4) for enumerating the blood-platelets in human blood. A special counting chamber is selected, only 0.02 millimeter high and a special pipette permitting a dilution of 1:30. The blood is diluted in this proportion with a fresh filtered solution of sodium metaphosphate, and then examined in the chamber with the high objective. An even distribution will generally be obtained of the round or oval, highly refractive bodies, whose interior generally contains an eccentric darker area, the nucleus. Their size is one-third to one-half that of the red cells. During health the average number counted was 228,000. A large number of counts were made to ascertain if the same diurnal fluctuations occur as with red and white cells, but with inconstant result. Fasting and the ingestion of food also seems to be without marked influence. In the various forms of anemia, normal or slightly increased figures were obtained. A definite relation between the time of coagulation and the number of platelets is undeniable, for in a case of purpura hemorrhagica they were exceptionally low and increased in number as the patient improved. High figures were found in moderately severe cases of tuberculosis, carcinoma, pulmonary gangrene, empyema, spondylitis posttyphosa, erysipelas, sepsis, pneumonia (after the crisis), typhoid (after the disease is over). In the latter two diseases there is a diminution throughout the course.

Renal Changes in Experimental Hemoglobinuria.—It is a well-known fact that if blood which has been rendered laky, is injected into animals, death may occur in a few minutes. At autopsy, characteristic renal changes will then be found. L. LEVY (*Deutsch. Arch. f. klin. Med.*, Vol. 81, Nos. 3 and 4) claims that these lesions are caused directly by the free hemoglobin which seems to have a specific action upon the epithelial cells of the convoluted tubules, leading to the formation of hemoglobin casts. It is an interesting fact that the same lesions are found if blood-poisons, such as toluylendiamin are injected, which goes to show that the liberated hemoglobin and not the drug itself, is the toxic agent.

On the Production of a Specific Gastrotoxic Serum.—A research was conducted by C. BOLTON (*Proc. Royal Soc.*, September 28, 1904), from two points of view, namely, to add if possible any facts to the knowledge of cytotoxic action, and to throw some light upon the pathology of human gastric ulcer. The following conclusions were arrived at: On either intraperitoneal or subcutaneous injection of the stomach cells (or a fresh extract of them) of the guinea-pig into the rabbit, the blood serum of the latter becomes highly toxic for guinea-pigs. The serum leads to death on injection into the guinea-pig and causes necrosis of the mucous membrane of the stomach, leading to ulceration and hemorrhage. The toxin contained in the serum consists of at least two factors: (1) A specific gastrolysin, which leads to necrosis; (2) hemolysin which assists in producing hemorrhage. The hemolytic factor can be removed, leaving the gastrolytic, which still produces stomach lesions. The gastrolysin is a specific cytotoxin and consists of an immune body and a complement. It does not visibly affect the cells in vitro, and it does not produce necrosis in the stomach of the animal which has elaborated it, possibly owing to the concomitant formation of an anti-immune body. By injection of the stomach cells of the rabbit into the rabbit a gastrolysin is formed which causes necrosis in the guinea-pig's stomach; it therefore possesses at least two cytophilic affinities. By injection of the stomach cells of the guinea-pig into the guinea-pig a gastrolysin is formed which causes necrosis in the stomach of the rabbit; this gastrolysin is probably of a similar nature as the preceding. The importance of the above conclusions with regard to the pathology of human gastric ulcer lies in the fact that an animal can elaborate in its own blood by the absorption of the cells of a similar animal, and, therefore, presumably of its own cells, a toxin which would cause necrosis in the mucous membrane of its own stomach were it not for some deterring influence, probably the concomitant formation of an anti-immune body.

Human Blood-fluids and the Staphylococcus Pyogenes.—It had been determined by Wright and Windsor that normal human blood does not exert upon the staphylococcus any bactericidal action whatever, and that anti-staphylococcus inoculations do not lead to a development of any bactericidal power in the blood. Wright also found that phagocytosis of bacteria is dependent upon an effect exerted upon the bacteria by the blood fluids,—the bacteria being prepared by the latter, for the action of the phagocytes,—and he spoke of this effect as an opsonic effect. A. E. WRIGHT and S. R. DOUGLAS (*Proc. Royal Soc.*, September 28, 1904), further found that the increased phagocytic effect which is obtained with the blood of successfully immunized persons is attributable not to any modification induced in the leucocytes, but to an increased opsonic power in the blood fluids. Normal serum does not exert any characteristic agglutinating action upon the staphylococcus. Such agglutination as is obtained is not very sensibly increased under the influence of staphylococcus inoculations. A low phagocytic power and staphylococcus infection are related to each other by some fact of causation. While it is *a priori* possible that the diminished power which characterizes those infected by the staphylococcus might be the result of the staphylococcus invasion, it is infinitely more probable, in view of the entire absence of clinical symptoms in the slighter cases of staphylococcus infection, that it is the defective phagocytic power of the patient which furnishes to the staphylococcus, which is normally present upon the surface of the body, the opportunity for invading the skin. The authors studied the distribution of the opsonins in the infected organism. Wright and Lamb had found in the case of patients who had succumbed respectively to typhoid and malta fever that the amount of agglutinins in the splenic pulp is invariably less than in the circulating blood, in some instances over 200 times less. Lamb further showed in the case of monkeys examined immediately after the crisis of spirillum fever, that the splenic pulp (where the spirilla still survive after they have disappeared from the circulation) is much poorer in bactericidal and bacteriolytic substances than the circulating blood. It, therefore, appears that he *Bacillus typhosus*, the *Micrococcus melitensis* and the *Spirillus Obermeyeri*, respectively multiply and maintain their existence, within the infected organism in regions of low bacteriotropic pressure. (By "bacteriotropic pressure" is meant the mass effect exerted upon the invading bacteria by the protective substances contained in the blood-fluids). The authors assume that the lowered bacteriotrophic pressure in the nidus, where the micro-organisms are cultivating themselves, results from a retarded replacement of protective substances which are removed from the body-fluids, where these come into contact with bacteria. It may be enunciated as a proposition of general application that the invading micro-organisms cultivate themselves in the organism in regions of lowered bacteriotropic pressure. This is true with respect to staphylococcic infection.

The Action of Colloidal Silver on Toxins in the Blood.—The clinical experience that colloidal silver has a favorable action in various forms of bacteremia, has led H. J. HAMBURGER and M. J. HEKMAN (*Arch. Internat. de Physiol.*, July, 1904), to test this result by means of experimented investigation. They studied the effect of collargolum upon the hemolytic power of staphylotoxin. The addition of one-quarter cubic centimeter of a one per cent. solution of collargolum to one cubic centimeter of staphylotoxin serum, prevents hemolysis. On the other hand, doses of one-quarter cubic centimeter of collargolum in concentrations less than one per cent. 1-500, 1-1,000, etc.) to two cubic centimeters of staphylotoxin serum, increases hemolysis. Even a solution of .00000116 gram of collargolum to 2.5 cubic centimeters of liquid has this favorable effect on hemolysis. The authors attribute the inhibitory action of the greater concentrations of collargolum to some catalytic effect.

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ASEPSIS IN SURGERY.

IT is evident that surgery is as yet on the borderland only of the aseptic goal toward which she has been struggling for many years. If we are to believe, as we certainly have every reason to, the sanguine expressions of hope from the mouths and pens of the most eminent operators, the day is perhaps not far distant when we shall have actually reached the aseptic era.

The subject, however, is one to which the theory of limits is so admirably adapted that it must be conceded by all that the perfection ultimately to be reached in this matter will be in the nature of infinitesimal imperfection. That this is true is attested to by the variations in the beliefs of the men who have given the subject profound attention.

A. J. Ochsner, in the *Annals of Surgery* for October, says, "My observations have convinced me that the only form of infection which must be considered in surgery is *contact* infection. This is due to the introduction into the wound of septic material from uncleaned hands, instruments, sponges or dressings, or from speaking or breathing into the wound."

Charles Harrington, of Boston, records in the same journal that during an operation for hernia at one of the principal city hospitals he placed a sterile Petri dish about eight inches from the instruments upon the instrument table. "At the close of the operation the dish was removed and incubated. The result demonstrated that upon each square inch of the dish, and inferentially of the table, and of the instruments thereon, and presumably in the field of operation, no less than 120 organisms, chiefly pus cocci, were deposited from the air in the course of an hour. It is not for me to say how much danger may reside in such a shower of bacteria. Frankly, I do not know, nor does there seem to be any unanimity of opinion on the part of those who have investigated the question of aerial infection."

George H. Monks, in the same number of the *Annals*, remarks: "Whatever may be the actual danger of air infection, direct or indirect, and pending the results of more definite experiments, the demonstrated existence of pathogenic bacteria in the air of large hospitals is presumptive evidence of the necessity of some efforts looking toward their exclusion. Therefore, it is necessary to mop the floor . . . and to minimize drafts from all sources. It is presumably safer also to filter the air."

The conclusions reached from certain experiments with air infection, conducted under the direction of Monks, at the amphitheater of Boston City Hospital, were as follows: At no time in the twenty-four hours was the air free from organisms, the smallest number being found between midnight and seven o'clock in the morning. The vast majority of the organisms were harmless saprophytes, although in some plates of every series staphylococci were found. The streptococcus was found in two instances only.

Chicago is to be congratulated in having in the new and modern Augustana Hospital, as designed by Ochsner, a building in which surgical research can be carried on with satisfaction. Dr. Ochsner is further particularly fortunate in the fact that he has a method of training his assistants, which for perfection of detail is probably to be equaled, in the east, at least, only at the Johns Hopkins Hospital.

The system is based upon the belief that the source of wound infection can be detected only by limiting the number of persons who come in contact with anything which in turn comes in contact with the wound. The staff therefore consists of one operating nurse, one chief assistant, three second assistants, and six third assistants. The present operating nurse has been the sole

nurse assistant for the last 5,000 operations. The chief assistant holds office for three years. He is chosen from the two second assistants, whose term of service is eighteen months. These in turn are chosen from the third assistants, whose term of service is four months. The third assistants take no part in the operating.

It is indeed not to be wondered at that with such a carefully organized corps of assistants Ochsner has been able to carry on the immense amount of excellent work with which he is accredited.

It has sometimes been said, and there is no denying that much truth supports the assertion, that the spirit of surgical investigation is not rife in the city of New York. The profession here has been charged, both seriously and in jest, with commercialism and a tendency to merge the science of surgery into an art. It is not altogether the result of that well-known commercial environment which pervades everything in New York that has led to this unfortunate state of affairs.

There is, we believe, no institution in this city equipped, so far as its corps of assistants go, as well as the hospital of the Mayos', at Rochester, Minn., as the Department of Surgery at Johns Hopkins, or as the Augustana Hospital of Chicago. Why such an institution, based on the lines of these hospitals, has never sprung into being in New York has been a source of astonishment and regret to not a few.

It is to be hoped that the establishment of the Rockefeller Institute for the development of the Science of Medicine will bring into being an organization, along similar lines, for the furtherance of the science of Surgery.

A SPECIFIC PRECIPITIN REACTION IN BOTHRIOCEPHALUS INFECTIONS.

WHILE it is quite generally held at the present time that all forms of pernicious anemia are probably the outcome of definite intoxications, this view has recommended itself especially in the interpretation of the disease accompanying parasitic infections. Experimental research in this direction has, however, been rather meager and largely confined to the study of the *Bothriocephalus* infection.

This parasite, it will be recalled, belongs to the order of tapeworms and is quite common in the lake regions of Switzerland, northern Russia, southern Scandinavia and northern Italy, where infection takes place through certain fish, which are eaten either raw or imperfectly cooked. In the United States only a relatively small number of cases have been reported in the literature, but it is quite likely that the disease is more common among the Scandinavian and Finnish population of our great lake States than is generally supposed.

Regner, in 1889, first demonstrated that the broad tapeworm, as it is also commonly called, can produce the exact clinical picture of the typical pernicious anemia, as described by Biermer, and since then his observations have been abundantly confirmed. As in the case of the hookworm infection, however, anemia does not occur in all individuals who harbor the parasite. Individual peculiarities here exist, the nature of which we are as yet in ignorance.

The first experimental proof of the genetic relationship between *Bothriocephalus* infection and the corresponding anemia was brought by Tallqvist and Schaumann, who succeeded in producing a distinct anemia in dogs by feeding with the freshly obtained tapeworms. Subsequently these same observers showed that the worm possesses distinct hemolytic properties. The most recent researches in this direction come from Kraus's clinic in Berlin and are especially interesting, as they demonstrate that the body of the host contains specific albumins, which are referable to the infecting parasite and have manifestly been absorbed. This has been proven by the demonstration of corresponding precipitins in the blood of the patient. To this end a *Bothriocephalus* extract was prepared by the autolysis of about twenty-five grams of freshly procured proglottides. On bringing one c.c. of the resulting solution together with one c.c. of the patient's blood serum a distinct precipitate then resulted, even in a dilution of the parasitic extract of 1:1,000. Normal blood serum gave no precipitate.

As confirmatory evidence that the precipitin found in the human blood serum was referable to the *Bothriocephalus* infection, a rabbit was further immunized with the worm extract and a corresponding examination made. This showed that the rabbit blood serum now also contained a precipitin, and yielded a precipitate with the worm extract in the dilution of 1:1,000.

It can thus hardly be questioned that absorption of an albuminous substance takes place which is directly derived from the worm. But

on the other hand there are no data available as yet, which would enable us to decide whether this substance is produced during the life of the organism, or whether it is a product of the autolysis of necrobiotic proglottides.

However this may be, the observation is one of great interest and suggests avenues for the investigation of some of the cryptogenetic forms of pernicious anemia also, not to speak of the anemia associated with hookworm infection, material for which is manifestly common enough in some of our Southern States.

RECENT ADVANCES IN TYPHOID FEVER.

AT this season of the year, typhoid fever is always the most interesting of affections for the general practitioners of medicine throughout the country. Notwithstanding the definite knowledge that typhoid fever is an easily preventable disease, practically always water-borne, every fall sees a series of at least small epidemics in various cities throughout the country. Most of this is due to the fact that municipal politics are run for the benefit of the politician and not for the benefit of the people.

This seems to be especially the time to recall this fact, for now, with the presidential election over, most physicians will take not the slightest interest in politics, State or national, until another election approaches or, in many cases, even until another presidential election approaches. For those who bewail the unfortunate prevalence of typhoid fever every fall, it might be well to remember, or even to post up in some conspicuous place where they shall see it often, the expression of the modern sanitarian who said " whenever an individual dies of typhoid fever, some one should be hung."

In the meantime typhoid fever, like the poor, we always have with us, and so advances in our knowledge of the disease continue to be of enduring, or at least of ever-recurring interest.

One of the most recent bits of progress is the discovery that certain formamides, notably urotropin and its allies, if administered to the patient shortly before the blood specimen is taken for examination by the Widal reaction, will almost surely give rise to agglutination. Whether the patient has had typhoid fever or not, or is suffering from it at the present moment, cannot therefore be decided with any certainty if urotropin has been administered within twenty-four hours. Needless to say this, if found to be generally applicable, is of much moment. It is now fairly understood that in a certain number of so-called abortive cases of typhoid fever, in which the diagnosis has even been substantiated by a positive Widal test, the case has really been one of slight febrile disturbance, due not infrequently to intestinal indigestion, but not at all to the presence of the typhoid bacillus. The disturbing factors in the bacteriological diagnosis of such cases are probably many in number and they need further investigation.

With regard to the treatment of typhoid fever, the advances have been very limited. No new remedy has been suggested within the year that has seemed to promise to be of any enduring benefit. With regard to the feeding of typhoid fever patients, however, there has come a modification of the general persuasion as the necessity for an exclusive milk diet and a deprecation of the too great limitation of food, either in amount or variety. Liquid food is of course absolutely an indication of the disease. This need not necessarily, however, consist only of milk or even be composed mainly of milk. There are not a few persons who do not like milk, who cannot take it without a certain amount of disgust and in whom it constantly, even in health, produces a feeling of discomfort. Their digestive nature does not change because they happen to have acquired typhoid fever. It is an excellent dietary rule that declares that articles of diet which are unpleasant for the patient are not well digested and do not prove as nutritious as they otherwise would. To force such patients to take large quantities of milk is almost surely to initiate a disturbance of equilibrium of the intestines that is eminently undesirable under the pathological conditions present.

There are those who insist that not a few of the cases of persistent tympanites in typhoid fever will be found to occur in patients who have an initial dislike for milk yet have been persuaded much against their will to try and take it as an exclusive article of diet. For such cases a certain amount of milk modified in various ways by the addition of lime water, or of barley water, or of a tablespoonful of coffee to the glass, may prove to be readily digested. Other liquid foods, however, such as simple soups, into which an egg has been stirred, or pea soups and various thin broths should be used frequently as a relief from the monotony of an

otherwise exclusive milk diet. Where such precautions are not taken, it sometimes happens that so little of the milk is absorbed that the good old rule of feeding a fever, announced nearly a century ago, in the face of much opposition, by Graves, fails to be followed since so little of the material taken is absorbed. The result is a loss of strength that augurs ill for the issue.

The real advance in the treatment in typhoid fever that has come consists in the prompt, surgical intervention for perforation of the intestines. Whenever a typhoid patient suffers from any sudden change, a surgeon should be called in consultation. If the change noted begins with pain, however passing the painful condition may be, then very little more is needed to justify at least exploratory laparotomy Any disturbance of pulse or of temperature in addition, should be the signal for the surgeon being placed in charge of the case and being allowed to assume the responsibility. Hesitation or delay in this matter is almost sure to be fatal. It is the old problem of appendicitis over again. A very large part of the death-rate from typhoid fever is due to perforation and at least one-half the cases can be saved by prompt surgical measures. Hence the necessity for keeping the patient at all times under the eye of a trained attendant who shall report at once any sudden change in condition. There must be no waiting until the morning visit or the risk is almost sure to be serious. In strong individuals, immediate operation will not only prove life saving, but will usually enable the patient to react so promptly that the typhoid fever will run its normal course to convalescence without any disturbance or delay.

Unfortunately there is one difficulty with regard to this very promising aspect of surgical intervention for perforation. In a certain number of reported cases all the symptoms of perforation have been present, yet at operation no perforation could be found. Later on, at autopsy, it has been found that the intestine has not been ruptured, but swelling of the mesenteric glands has occurred and that this had caused local suppuration with adhesive peritonitis affecting certain coils of the intestine and thus caused serious disturbance of peristalsis. These cases are thought to be very rare, but since attention was first called to them, every little while sees the report of another one. It is clear that where perforation cannot be found, ruptured mesenteric glands should be looked for and their contents removed as far as is possible and consistent with the patient's condition.

ECHOES AND NEWS.

NEW YORK.

The Society of Medical Jurisprudence.—The 184th Regular Meeting was held Monday evening, November 14. Charles Greene Cumston, M.D., of Boston, Mass., read the paper of the evening, entitled "Remarks on the Jurisprudence of Civil Malpractice, Based Chiefly on the Decisions Rendered by French Courts." Collation after the meeting.

Harvard Medical Society.—The Harvard Medical Society of New York City wishes to announce that Professor Theobald Smith, of Harvard University, will deliver an address upon "The Place of Research in the University Medical School," in Hosack Hall, New York Academy of Medicine, November 26, at 8:30 P.M. Members of the medical profession are cordially invited to attend.

Dr. Bolton Leaves Hartford.—The private sanatorium, established by the late Dr. C. M. Kittredge, was reopened November 1, under the direct care and supervision of Dr. James R. Bolton, formerly of the Hartford Retreat. Kingston, N. Y., is his address.

Dr. Packer at River Crest.—Dr. Flavius Packer, announces his removal to the River Crest Sanitorium, Astoria, L. I., as physician in charge.

French Hospital Open.—The new hospital of the French Benevolent Society, at 450 to 458 West Thirty-fourth Street, was opened Monday by M. Jusserand, the French Ambassador. Representatives of the Governments of Greece and Russia, and a distinguished company of Franco-Americans also were present. M. Jusserand formally declared the hospital open, after the many visitors had had an opportunity to inspect it throughout, and in the process had bought many roses at $1 each from many pretty flower girls. There was no extended speechmaking, but President Maillard, of the Benevolent Society, had a little something to say in introducing M. Jusserand. It was, in part, as follows: "We have dreamed to possess, in this great commercial metropolis of the world, a hospital establishment in keeping with France, which, if not better ordained than the one we already had to meet the necessities of growing usefulness, at least was large enough to render all the services incumbent thereupon—better provided, according to the most recent data of hygiene and the progress of science, and in accordance with the new municipal requirements always strictly to be adhered to; in short, a hospital really worthy of the French flag which we are so proud to float. What of the effort consumed? The end is attained! On new foundations, which, more solid, absorb the old ones, we have constructed a beautiful edifice, and, while meeting the needs of the present, we have perhaps more broadly than is generally done in such cases assured the future." The French Benevolent Society, in its different services, out-of-door assistance, dispensary, etc., and in its hospital, is nonsectarian, and relies purely for the support of its charities upon public donations. Most of the patients treated in the hospital are treated free of charge. To obtain the funds necessary for the new

hospital, the society, which had only about $100,000, made an appeal, and as the French Government headed the list of subscriptions with 100,000 francs, $100,000 was quickly raised. Since that subscription, a legacy and the sale of the Gobelin tapestry, also donated by the French Government, have brought the total to $225,000. The hospital has cost $400,000, leaving a mortgage of $175,000, which the Board of Administrators feel able to carry. The hospital is the third of its name, and will be open for the reception of patients on Tuesday. The first hospital was started in 1881, at 131 West Fourteenth Street, the second in 1888, at 320 and 322 West Thirty-fourth Street. The patients now there will be transferred to the new hospital, 450 to 458 West Thirty-fourth Street. The new building is seven stories in height, with a façade of red brick and limestone, and is 104 feet in length. The driveway is covered. Two floors are given up to private rooms and small wards, and two are used for the large medical and surgical wards. The operating rooms, the pathological laboratory, and the quarters of the house doctors occupy another floor. The top floor is absolutely isolated. It contains the wards for consumption and other contagious diseases.

Society for Psychic Research.—Prof. James H. Hyslop has written a long letter to the *Tribune*, setting forth the aims of the above society and asking for public contributions to aid in further investigation of psychic phenomena. He says in part: "An important institute intended to be of a national character has been founded in this city for the purpose of organizing certain scientific investigations while it conducts in one of its fields a system of philanthropic work. Its needs are the subject of this brief explanation. It has been incorporated as the American Institute for Scientific Research. It is not to be associated with any form of teaching or propagandism, whether philosophical, scientific or religious, but is modeled after the Carnegie Institution, except that it will be permanently limited to a definite field of work, comprising two more or less distinct classes of phenomena. Modeled as it is after the institution mentioned, the institute will not engage directly in investigations, but will supervise endowments and subsidies for such men and bodies of men as are qualified to conduct philanthropy and investigation in the fields which our work is to occupy. But as the two departments of work are somewhat different, only one of them offering opportunities for philanthropy, it will be necessary to consider them apart. The two fields comprehend abnormal and alleged supernormal psychology, or psychic research. As soon as possible the institute would provide a proper clinic for study and therapeutic treatment of certain types of functional mental disease, insanity, hallucination, secondary personality, and such troubles as may be made to yield to hypnotic suggestion. The type of institution here in mind is that of the Salpêtriere, under Pierre Janet, or the Clinic of Berillon, in Paris. At present it is well-nigh impossible, owing to the absurd misconception of the subject by the public, though they favor its use when other methods fail or when it is wise to employ it."

PHILADELPHIA.

Cancer Hospital Receives Charter.—A charter has been granted to the incorporators of the American Oncologic Hospital for the treatment of cancer and other tumors. Generous contributions are being made for the erection of buildings, and a committee is deciding on a site for the institution.

Celebrates 134th Birthday.—Mary McDonald, an inmate of the Home for Aged and Infirm Colored Persons, celebrated on November 14 her 134th birthday. What appear to be authoritative records confirm the age of this remarkable old lady. She has been blind for two years, but still retains many of her faculties. During the past year she has failed perceptibly, and now spends nearly all of her time in sleep.

The Schott Treatment of Diseases of the Heart and Blood Vessels.—At the Philadelphia County Medical Society, November 9, Dr. J. M. Anders gave his impression of this treatment as obtained by personal observation at Bad-Nauheim. He says that physicians abroad and in this country have only a vague idea of the proper cases for this treatment. On the whole, he was very favorably impressed by the results obtained in certain cases, and he is fully in accord with the principles of the treatment. Among the cases observed were two of acute dilatation of the heart coming on during an attack of valvulitis; in these the treatment resulted in complete restoration to the normal. A third case was one of failure of compensation in valvulitis, and a fourth was an instance of chronic valvulitis. A fifth case was an illustration of a certain class of cases in which digitalis loses its effect and after a course of the baths again exerts its action.

The Schott Treatment at Home.—Dr. James Tyson said he would employ the Schott method more often were it not for the difficulty in carrying it out at the patient's home. The baths can be used in a private house, but a helper is needed the same as for the exercises. There was for a time a man and also a woman in Philadelphia who could superintend the baths and exercises, but the demand for their services was so small that they could not continue at the work. The action of the carbonic acid is the most difficult to imitate at home. In chronic or acute dilatation, partial recoveries are obtained by the Schott treatment, and in some cases too far advanced to send to Nauheim, much good may be secured from home treatment. Dr. Tyson has not availed himself fully of the exercises, preferring to use the baths until as much good as possible has been accomplished by them, and then adding the resistance movements. The baths are contraindicated in cases of dropsy, effusions and other collections of fluid. A practical way of regulating the baths is to desist if the patient feels more uncomfortable after using them; when relief is experienced they should be continued. A very essential point is that in winter the baths should be taken in a warm room.

Technic of the Baths.—Dr. S. Solis-Cohen said there were in Philadelphia people trained in the administration of the treatment in question, and also establishments where they can be cared for. The baths can be given at home if care in the technic be employed. A good plan is to put in the tub half of the water to be employed, having this as hot as possible. The sodium bicarbonate and salt should then be put in and left for twenty minutes. Water of a temperature to make the entire amount comfortable should then be added in the required quantity and finally the acid sulphite, which will give a profuse effervescence. In this way can be obtained results almost as good as those secured at Nauheim. Dr. Cohen gives courses of six or eight

weeks, and then interrupts for eight or twelve weeks, this being followed by a repetition of the course. The baths are given at night before the patient retires, and on alternate days, the intervening days being devoted to the resistance exercises. This treatment will do good in exophthalmic goiter, but may be of great danger to the patient. In this disease, Dr. Cohen would not trust an attendant with the supervision of the treatment.

Study of the Nervous System in Congenital Deformities.—At the Pathological Society, November 10, Dr. D. J. McCarthy presented specimens taken from a puppy that was born with both hind feet turned up and in, presenting a form of clubfeet. Elaborate studies of the spinal cord have been made and later the peripheral nerves will be examined. The lumbar segment of the cord corresponding to the areas of deformity showed marked degenerative changes involving the ganglion cells and also the posterior columns. Above and below this segment were conspicuous areas of hemorrhage. Secondary degeneration above the lesion was pronounced. A noteworthy feature was that of the ganglion cells giving the reaction for iron, showing that they had absorbed hemoglobin.

Erosive Gastritis.—Dr. John Funke exhibited specimens from a case of chronic gastritis with extensive erosions. The lesions were situated mostly along the lesser curvature, and especially in the region of the pylorus. The greater number were between the folds of the mucosa; they varied from one millimeter to one centimeter in diameter, and from one to two and a half millimeters in depth. Dr. Funke does not regard this condition as a forerunner of gastric ulcer, the two being in no way dependent upon each other. Erosion of the gastric mucosa is not considered an entity, as it is, as a rule, concomitant with diseases of the mucous membrane of the stomach. The condition is analogous to ulcerative stomatitis or colitis. The erosions are not necessarily due to the action of the gastric juice, usually resulting from superficial necrosis. Areas of infection following embolism or thrombosis may undergo auto-digestion, but such occurrence is rare. The secretion of substances into the stomach may also be responsible for alterations in the mucosa.

CHICAGO.

Vaccine Virus.—Owing to the great demand for vaccine virus, which, it is said, has caused some producers to place unripe lymph on the market, the Health Commissioner has tendered to all producers of vaccine the services and facilities of the laboratory of the Health Department, and of its expert clinicians, in the bacterial and clinical examinations of all their vaccine products offered for sale and use in Chicago. All vaccine submitted for such examinations, and found to be pure—that is, free from disease-producing organisms, and potent—that is, producing not less than 90 per cent. of successful primary vaccinations—will be so certified by the Department. Defects in either respect will be duly notified.

Money for Hospitals.—The will of Moses Bensinger devises $1,000 to the Michael Reese Hospital and $500 to the Alexian Brothers' Hospital.

Diagnosis of Malignant Abdominal Tumors.—Dr. G. W. Green read a paper on this subject before a recent meeting of the North Branch of the Chicago Medical Society, in which he summarized thus: (1) It is very important for the general practitioner to be a good diagnostician of malignant abdominal tumors. (2) Know the normal anatomy of the abdominal cavity. (3) Trace all tumors to the organs from which they spring. (4) Gastric carcinoma are the most frequent malignant abdominal tumors, and spring from old unhealed ulcers, which could have been cured by a previous operation for gastric ulcer. (5) Uterine carcinoma of the cervix springs from lacerated cervices previously unrepaired. These should have been repaired. (6) If in doubt about the malignancy of any abdominal tumor, give the patient the benefit of the doubt, make an exploratory laparotomy and see.

CANADA.

Quarterly Meeting of the Ontario Board of Health.—The Ontario Board of Health was in quarterly session last week in Toronto, when it was reported that two counties were going to avail themselves of the bonus promised by the legislature to groups of counties who would undertake to erect and maintain sanitoria for consumptives. If this is decided upon by the counties of Oxford and Waterloo, other counties will doubtless soon fall into line and Ontario will be putting up a stiff fight against the great white plague. The Board passed a resolution expressing hearty sympathy with the Canadian Association for the Prevention of Tuberculosis, which is endeavoring to secure the establishment by the Dominion Government of a sanitarium in each province. The report of the secretary for the quarter showed that there had been 412 deaths in Ontario from tuberculosis during the quarter ending September 3, an increase of 20 per cent. over the corresponding quarter of last year. The deaths from all causes totaled 5,872, compared with 5,893 for the corresponding quarter of 1903. The report also showed that here had been a marked increase in typhoid fever throughout the province during the past quarter, and a decrease in diphtheria.

Vaccination Popular in Montreal.—The Medical Health Officer of Montreal, Dr. Laberge, for 1903 shows that out of 90 cases of smallpox reported in that city during 1903, not even one person suffered from the disease who had been vaccinated during the past five years. Speaking of his report the Medical Health Officer says that it has been proven by experience in Montreal that persons who get vaccinated are practically immune from taking the disease. He also states that he has knowledge that persons who had been vaccinated when they were children, and who had contracted the disease later in life had suffered very little from it. He was glad to say also that Montreal was now a much better vaccinated city than it was many years ago. At the present time the Health Department of Montreal has the cooperation of all schools and factories in the city in order to enforce vaccination. At one time the charge was made that Montreal was a good place to go to if one wished to contract smallpox. The civic officials, who are at present going the rounds of the schools performing vaccination, report that they are meeting with no opposition, whereas two years ago, when the same officials visited the schools, there were 1,000 children who refused to attend school because they had to submit to vaccination. At the 1st of January, 1903, there were five cases of smallpox in the smallpox hospital, and there were ninety other patients admitted during 1903. The deaths number two, and there remained in the hospital on the 31st of December one patient. Of

this number admitted the males numbered 41 adults and 11 minors; females, 26 adults and 12 minors. The number of these vaccinated since five years was nil. The number vaccinated some years ago, 13, while 77 had never been vaccinated.

Montreal Endeavoring to Lessen Spread of Consumption.—The City Council of Montreal has decided to adopt the following by-law prohibiting spitting on sidewalks and in public places, having in view the object of preventing as far as possible the spread of consumption in that city. "No person shall spit upon the floor of any railway car, street car or other public conveyance, or upon the floor of any public building, theater, church, opera house, music hall or hall used for public meetings; railway or steamboat stations or waiting rooms or other public hall, building, room or place, or upon any platform surrounding, in front of, or in the immediate vicinity of any such place, or upon any sidewalk or covered way within the limits of the city of Montreal."

The Care of the Insane in Ontario.—The Provincial Secretary of Ontario, through the Inspector of Prisons and Public Charities, Dr. R. W. Bruce Smith, of Toronto, has given instructions that each jailer in the province of Ontario shall make a special report to the Department on the first day of each month giving the names of all persons confined in the jails of the province who have been certified by the jail surgeon to be insane. The sheriff of each county in the province has also been requested to make a similar return on the first of each month to the medical superintendent of the asylum for the insane for the district in which that jail is located. The Department of the provincial secretary is at the present time removing from the jails and placing in the asylums all those persons who are suitable for asylum treatment. Thus those arrested for insanity hereafter will not be forced to remain in the common jails, as there is now sufficient accommodation in the asylums of the province.

Toronto's New Consumption Hospital.—On September 2 the first patient was admitted to the Toronto Free Hospital for Consumptives, situated about ten miles from the city. Already the number admitted has attained to forty and no case is refused because of inability to pay. Building operations, however, are still in progress as the institution is not yet completed. Surrounding the hospital is an area of rising land forty acres in extent, beautifully wooded. The hospital is conducted under the auspices of the National Sanitarium Association, and will be maintained by the per diem allowance allowed by the city of Toronto, by a Government grant and private subscriptions. Dr. Allan H. Adams is the physician-in-charge.

Staff Changes in the Ontario Asylums.—Dr. R. W. Bell, second assistant physician at the Asylum for the Insane at London, Ontario, has been appointed to the position of medical inspector of the Provincial Board of Health of Ontario. His position at London has been filled by the transfer of Dr. W. C. Herriman from the Kingston Asylum, and Dr. MacNaughton, of London, has been transferred to Kingston. Dr. W. P. St. Charles, of the Mimico Asylum, has been appointed to the position of relieving officer to the public institutions of Ontario and Dr. George M. Biggs has succeeded him. Dr. W. T. Wilson, third assistant physician at the Hamilton Asylum, has been transferred to London to succeed Dr. MacNaughton.

GENERAL.

Surgeons at Pan-American Congress.—Dr. Rudolph Matas, Secretary of the Section of General Surgery for the United States, asks those who wish to contribute papers, to send titles to him at No. 2255 St. Charles Avenue, New Orleans. He also announces that the United Fruit Company's agents are offering as a special inducement to American congressists a reduction of the regular fare for the round-trip from New Orleans to the Isthmus to $50, that is, $25 each way. The steamers leave New Orleans every Friday: the last steamer to leave New Orleans in time for the opening of the Congress will sail on December 30, 1904, at 11 A.M. It takes about four and one-half days to reach Colon and seven days on the return trip on account of a stop-over at Port Limon, where ample opportunity is given to tourists to visit San Jose, the beautiful capital of Costa Rica—"the Paris of Central America"—where the most picturesque tropical scenery can be seen at this season, under the most favorable conditions.

The National Association for the Study of Epilepsy and the Care and Treatment of Epileptics.—The fourth annual meeting of this Association will be held in the Medical Library "The Fenway," Boston, Mass., on November 22. The first session will begin at 2:30 P.M., the second at 8:00 o'clock in the evening. All persons interested in the welfare of epileptics and in charity work generally, are cordially invited to attend the meetings. The following program is announced: Presidential Address, by William N. Bullard, M.D., of Boston; The State's Relation to the Epileptic, by Owen Copp, M.D., Executive Officer of the Massachusetts Board of Insanity, Boston; The Prognosis of Epilepsy, by William Alden Turner, M.D., of London, England; The Influence of Puberty and Adolescence in the Etiology of Epilepsy, by William P. Spratling, M.D., of Sonyea, N. Y.; Certain Aspects of the Differential Diagnosis Between Hysteria and Epilepsy, by Drs. Putnam and Waterman, of Boston; Some Observations on the Treatment of Epilepsy, by Daniel R. Brower, M.D., of Chicago, Ill.; Spectrum Analysis of the Blood in Epilepsy, by J. W. Wherry, M.D., of Clarinda, Iowa; Syphilitic Epilepsy, by Abner Post, M.D., of Boston; (*a*) Observations on Blood Pressure in the Epileptic, (*b*) Lantern Slide Illustrations of Cases, and of the Massachusetts Hospital for Epileptics, by Dr. Everett Flood, of Palmer, Mass.; Ten Cases on Special Treatment, by Drs. Morton and Green, of Palmer, Mass.; (*a*) Salt Poor Diet, (*b*) Reflexes in Epilepsy, (*c*) Status Epilepticus, by Dr. Morton; Lumbar Puncture in Status Epilepticus, by Dr. Morton; (*a*) Myoclonus Epilepsy, (*b*) Exhaustion Paralysis, by Dr. Hoskins, of Palmer, Mass.; Private Colonies for Epileptics, by Dr. E. A. Sharp, of New York; Duties of the State with Reference to Epileptics, by Dr. Max Mailhouse, of New Haven, Conn.; Dietary in Epilepsy, by Dr. L. P. Clark, of New York.

Tests for Cold Storage Food.—Dr. Harvey W. Wiley, the government chemist, who has discovered that nearly every kind of modern food is filled with deleterious substances, has turned now to the investigation of cold storage foods. He has on hand a fine assortment of provisions which have been for a long term in the cold storage plant of the West Point Military Academy. Dr. Wiley's idea is to give this food to one or more persons and to observe its effect upon the normal system. "In testing cold storage food, chemical analysis must be relegated to the rear," said Dr. Wiley. "The sense of taste alone can guide the expert in cold storage products. Therefore, I have made up my mind to be one of the jury of epicures to sit in judgment upon the cold storage food. What we want is a man, with a delicate memory—a man who when he takes his first bite of beefsteak that has been in the ammonia tank

for three years has an overpowering gift of remembrance which will carry him back retrospectively to an occasion when he sat down to a juicy, done to perfection tenderloin."

Beverage Statistics.—France drinks the most wine and Belgium the most beer. The United States as a consumer of spirits, beer and wine runs far behind most countries. The monthly summary of commerce and finance, issued by the Department of Commerce and Labor, says: "France shows the heaviest consumption of the most concentrated beverage spirits, viz., 2.51 gallons per inhabitant. The other countries following in the order of their per capita consumption of spirits, are: Sweden, 2.13 gallons; Germany, 2.11 gallons; Belgium, 1.42 gallons; United Kingdom, 1.38 gallons; United States, 1.33 gallons; Russia, 1.29 gallons, and Italy, .34 gallons. The figures per capita of beer consumption reveal the fact that Belgium stands at the head of the nations, its per capita consumption being 56.59 gallons; second in order is the United Kingdom, with 35.42 gallons, while Germany, which shows the largest absolute figures of consumption, in the matter of per capita consumption, takes third place, with 30.77 gallons; the United States follows with 18.04 gallons. The consumption of wine may be said to be concentrated in two countries, chiefly France and Italy. The figures of per capita consumption in these countries—34.73 gallons in France and 31.86 gallons in Italy—are almost identical with those shown for beer by the United Kingdom and Germany.

Christian Science as a Disease Spreader.—Nothing could better illustrate the truth of our frequent contention, writes the New York *Times*, that "Christian Science" is a deadly menace to every person in every community in which the cult has a single follower than did the account we printed yesterday of what has just happened up in Stamford. The facts are worth repeating: In one of the public schools there, a week ago Monday, a boy of twelve was seen by his teacher to be suffering from fever and headache and was sent home in the expectation that he would receive the care he obviously needed. He did not get it. Instead of calling a doctor or even resorting to familiar household remedies, the mother summoned an Eddyite "healer" and the two undertook to convince the boy by the usual mummery and gibberish that he wasn't and couldn't be ill. This was kept up for days until finally the neighbors, concluding from what little they could learn that the boy had diphtheria, notified the authorities of the city. Then, on Saturday, a health officer forced his way into the house against the protests of its occupants. He found the boy dying of diphtheria and two other children suffering from the disease. Further investigation showed that a child of the "healer" was also suffering from it. A doctor was then called in, but it was too late to save the boy first attacked and he died on Sunday. From Monday till Saturday not the slightest precaution had been taken to prevent the spread of infection, and no use had been made of the beneficent discovery which has in recent years reduced diphtheria mortality from about 75 per cent. to 5 or 6—among the children of parents who believe in a science that needs no quotation marks. Perhaps the boy would have died with the best of care, but his chances of recovery would have been vastly increased if his mother had been a sane woman, no matter how poor or ignorant, and Stamford would not now be threatened with a serious epidemic among its children. It is incidents like this one that cause us to be filled with angry impatience when people say that the "Christian Scientists" are an excellent, well-meaning folk, even if they are sadly mistaken in their theological and philosophical notions, and that at worst they hurt nobody except themselves. As a matter of fact, every one of them is a public enemy, threatening death to all with whom they come in contact and to many who do not go anywhere near them. Yet one of the dispatches from Stamford says, that as the Litchfield child died while under the care of a physician and the death certificate is regular, it is not likely that any proceedings will be taken!

OBITUARY.

Dr. HARRY E. ALLISON, Medical Superintendent of the Matteawan State Hospital, died at Newburg, N. Y., November 12, after an illness of three weeks. Bright's disease caused his death. He was born on December 1, 1851, at Concord, N. H., and graduated from Dartmouth in 1875. Among his classmates was Frank S. Black, ex-Governor of New York. In June, 1878, he received a degree of M.D. and became assistant physician at Willard Asylum, Ovid, N. Y. He took a postgraduate course at the New York Polyclinic, and in July, 1889, he was appointed Medical Superintendent of the State Asylum for Criminal Insane at Auburn. He was appointed a member of the commission to found a new asylum for insane criminals at Matteawan, and on its completion, in 1892, the inmates of the old Auburn asylum were transferred there. Dr. Allison became Medical Superintendent and Treasurer, and held the place until his death.

CORRESPONDENCE.

TREATMENT OF SCARLET FEVER.

To the Editor of the MEDICAL NEWS:

SIR:—Your October 29 issue contains a paper by Dr. Henry L. K. Shaw, of Albany, N. Y., on "The Treatment of Scarlet Fever with the Moser Antistreptococcus Serum," in which the statement is made that Baginsky gave Aronson's Antistreptococcus Serum a thorough trial without satisfactory effects. This is, however, an error, as Prof. Baginsky reported in the *Berliner klinische Wochenschrift*, Nos. 48 and 49, 1902, as follows: "With the new and more concentrated serum prepared by Aronson, which never produced untoward effects, the temperature fell slowly but surely even in severe cases, the patients whose condition was serious from the first finally convalesced undisturbed by complications. This improved serum was injected in 34 cases, of which two died, a mortality of six per cent.; but in view of the small number of cases not much importance is attributed to this reduced death-rate. While the serum does not exhibit the overwhelming effect of diphtheria antitoxin, its action, though slow, is sure and continuous."

Prof. Baginsky says that he used the serum only after animal experiments made by Dr. Paul Sommerfeld, of his hospital, had shown its harmlessness and efficacy. Dr. Shaw also errs in stating that "Aronson obtained a serum from the throats of scarlet fever patients, which were passed through animals until they reached a high virulence, similar to the method employed by Marmorek." Aronson's serum contains, besides the portion produced by immunizing horses with highly virulent animal-passed streptococci, another portion which cannot be computed, and which is obtained by treating horses with streptococci cultivated from severe human cases without animal passage. This differs very considerable in mode of preparation from all the sera hitherto produced.

Prof. Baginsky did not, as is stated in Dr. Shaw's report, say that "scarlet fever is primarily due to the streptococcus;" he merely says that he "found streptococci in 696 out of 701 cases and in 100 autopsies, so

that the importance of these bacteria in scarlet fever is evident."

Yours respectfully,

SCHERING & GLATZ.

New York, October 31, 1904.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON GENITO-URINARY DISEASES.

Stated Meeting, held October 19, 1904.

The President, James Pedersen, M.D., in the Chair.

Perineal Prostatectomy.—Dr. F. Tilden Brown presented this subject. The patient, a retired merchant, sixty-two years old, was admitted to the Presbyterian Hospital on July 14, 1904. His brother died of consumption, otherwise his family history was negative. The patient had indulged moderately in alcohol and tobacco, and had always suffered from constipation. He denied gonorrhea and syphilis. He was sexually active up to twelve years ago, but had since been impotent.

During the past ten years there had been a gradual increase in the following symptoms: Frequency of micturition, the patient now getting up three to five times at night to pass small quantities of urine. The urine clouuy, sometimes ammoniacal in odor. Difficulty in starting stream; poor force; dribbling at end. Consciousness of incomplete evacuation, with occasional burning pain during the act. Three years ago he had an attack of acute retention, which was relieved without operation. Later, double vasectomy was done at Smith's Infirmary. He was catheterized for two months afterward, and no catheter was again passed until seventeen months ago, when he had another attack of acute retention. A physician was called, who made an unsuccessful attempt at catheterization, which resulted in moderate bleeding from the urethra. The patient was then referred to the Presbyterian Hospital.

The patient was a large, strong, well-nourished man, showing no evidence of anemia. On admission he was nervous and anxious, and evidently suffering great pain. The bladder extended up to the umbilicus, and was palpable as a tense, rounded mass. Rectal examination revealed an enormously hypertrophied prostate, and bimanual examination after superpubic vesical puncture indicated that most of the tumor was intravesical. The patient had not been able to void urine for twenty-four hours. After an unsuccessful attempt to enter the bladder with catheters of various shapes and composition, a large curved trocar and canula was introduced, and about 30 ounces of brownish, somewhat turbid urine evacuated. A No. 18 F. soft catheter was introduced through the canula and left *in situ by* suturing it to the skin.

Three days after admission perineal prostatectomy was done through an inverted Y-incision. The patient made an uneventful recovery, and was discharged from the hospital on August 27. On October 18 he reported that he had passed a few calculi since leaving the hospital. He was feeling and looking well, and was urinating about every three hours. The urine was still cloudy. There was never more than three drams of residual urine. The patient's impotence had not been improved by the operation.

Dr. Brown presented another patient with this same affection, who was a stage manager by occupation, born in Italy fifty-three years ago, and was admitted to Bellevue Hospital on March 4, 1904. His family history was negative. He had always been well until his eighteenth year, when through embarrassment he would hold his urine until he could scarcely pass it. This habit persisted for about ten years. Two years ago he had an attack of retention of urine, for which he was treated at the Columbus Hospital. He was catheterized twice daily for the first three or four days, and gradually recovered control of his bladder, and could pass urine fairly well, but suffered from a burning sensation after urination. Eight days ago, after a period of constipation, he was unable to void urine, and began to have severe pain in his bladder. On his admission to Bellevue, 26 ounces of urine were withdrawn with the catheter, and 22 ounces later in the day. He occasionally passed some urine voluntarily, and without pain. Rectal examination revealed marked enlargement of each lateral lobe, with interlobular furrow. Cystoscopic examination showed very prominent lateral prostatic lobes. On March 11 perineal prostatectomy was done through an inverted Y-incision and the enlarged lateral lobes removed. A perineal drainage tube was inserted and the right half of the wound closed. The patient had an uninterrupted convalescence, and when he left the hospital, on May 5, his perineal wound was closed; he was voiding urine at normal intervals, and the catheter test showed that there was no residuum.

Suprapubic Prostatectomy.—This was the subject of Dr. Willy Meyer. The patient was a man, seventy-four years old, who came under his care last May. About two years ago he developed hematuria, which was rather persistent, and had to resort to the use of the catheter. His symptoms gradually became more aggravated, and when Dr. Meyer first saw him he was passing the catheter hourly, day and night, and still oftener. He was greatly reduced in flesh and strength, and gave a history of having had several attacks of urethral fever. For six months there had been total retention. Examination per rectum revealed pretty high up a not specially enlarged prostate, the left lobe being slightly larger than the right. The urine was strongly alkaline, and had a fetid odor. The cystoscope, which was introduced with some difficulty, disclosed papillomatous excrescences on the surface of a projecting mass above the internal urethral orifice. Whether this mass represented a tumor or a middle lobe of the prostate, could not be said with certainty. On May 12, 1904, upon opening the bladder above the pubes, a rather confusing picture was presented. There was that mass directly above the left half of the internal orifice of the urethra, sessile, with a broad base, projecting into the lumen of the bladder. On its surface appeared that papillomatous growth, with phosphatic incrustations, as seen through the cystoscope. Paquelin's cautery was used to extirpate it. Soon, however, the whitish tissue of prostatic adenomata were visible, whereupon both lobes of the prostate were shelled out with ease. The remaining cavity was packed with sterile gauze, the greater part of the vesical wound sutured, and a tube left in the bladder wound. The patient made a good recovery, excepting that between the twelfth and sixteenth day he developed a hematuria, such as occasionally followed the Bottini operation. He gained rapidly in weight, and the frequency diminished, so that he

now passed his urine every three or four hours during the day and once or twice at night. He was able to completely empty his bladder. His sexual power was preserved.

Dr. Meyer said he still is a strong advocate of the Bottini operation in certain cases of prostatic overgrowth. In the face of a good deal of opposition he had continued to do that operation for five years, the time originally set down by him for the rough trial in order to help decide whether or not it deserved a permanent place in the surgery of the prostate. During those five years he had done the operation 59 times, twice only within the last two years. As in other surgical diseases, he found that no one method was suitable to all cases. He now tried to separate them, and decide in each instance whether to operate by the perineal incision, or by the suprapubic, or by the Bottini method. Those cases where the prostate presented no tumor on rectal palpation could be best reached from above, while those in which the projection was low down could be operated on either through the perineum or above the pubes. The speaker said he believed, according to his personal experience, the Bottini operation certainly deserved a place in the surgery of the prostate, and he thought this fact had been proven by his statistics. The method should only be applied, however, to carefully selected cases. In a recent case in a man seventy years old, with frequent attacks of angina pectoris and edema of the lungs, it was considered unsafe to resort to either general or spinal anesthesia, and a Bottini operation was safely performed under local anesthesia.

Dr. Eugene Fuller, in the discussion, said he could recall two cases similar to the one reported by Dr. Meyer. In one a thick, finger-like projection of the prostate came from the upper part of the urethra and a second from below, coming together at the urethral outlet. On straining, these two masses would approximate and caused absolute retention. A calculus was found imbedded underneath the lower projection. In another case, a negro, there were three of these fleshy projecting masses, and in that instance there was a great deal of retention and phosphatic grit. In both of these cases very little prostatic enlargement could be felt through the rectum. In cases of this character, Dr. Fuller said, he thought that the suprapubic route was practically the only one that gave a chance to do thorough work. The speaker said he had done prostatectomy by the perineal method about 80 times and by the suprapublic method over 225 times. While the enlarged prostate could be removed in most instances through the perineum, the mere removal was not the only essential part of the operation. The condition of hemorrhage also had to be considered. When you had to deal with a flabby bladder, capable of holding, perhaps, a quart of blood, and without any expulsive force, in such a case, the speaker said he would not do a perineal operation, as he wished to be in a position to help such a bladder expel its contents. Under these conditions one was very apt to get passive bleeding and have trouble. He recalled such a case in which a serious hemorrhage occurred on the fifth day after the operation, and the man's life was undoubtedly saved by rapidly removing a blood-clot through the suprapubic opening.

Cystic Hydronephroma.—This was the theme of Dr. F. Kämmerer. The patient was a man, about fifty years old, who, when he was seventeen, had a severe attack of hematuria lasting two weeks. He recovered and remained perfectly well until about five or six years ago, when his present illnes began. He again had hematuria, which persisted for some time. Four years ago he entered the German Hospital, and while he was under observation there he passed no bloody urine for several months, but shortly after his discharge the attacks recurred, and peristed, with occasional intermissions. About a year ago he first noticed that his abdomen was increasing in size, and since then the bleeding has become more severe. Dr. Bierhoff made a cystoscopic examination, and established the fact that the blood issued from the left ureter.

When Dr. Kämmerer first saw the patient last June he had an immense tumor in the abdominal cavity. The entire abdomen was so tense that it was not easy to say whether it was cystic in character, as it afterward proved to be. The patient's general condition was very poor, and a blood examination showed that the hemoglobin was reduced to 40 per cent.

The usual incision for these large renal growths beginning at the spine and ending at the outer border of the rectus muscle of the affected side was made, and the peritoneum opened to determine exactly the position of the overlying colon. This was then easily pushed aside, in order to prevent any injury to the nutrient vessels of the intestines, which pass over the median surface of the kidney. It now became apparent that he had to deal with a cystic tumor connected with the left kidney. Very great difficulty was experienced in tearing away the firm adhesions of the tumor to the diaphragm. The tumor proved to be a hydronephroma, showing evidences of advanced cystic degeneration. The man made a slow but uneventful recovery from the operation.

Dr. R. Weil said that while the tumor resembled a hydronephrosis, the contents of the sac were entirely different from those met with in that condition. It was filled with a chocolate-brown fluid, Very little kidney tissue remained. The speaker said he had been able to find two exactly similar cases in the literature, and both gave the same clinical history.

Cancerous Prostate Removed by Suprapubic Incision.—This specimen was shown by Dr. Willy Meyer. The patient from whom the specimen was removed was a man of sixty years, who gave an old history of gonorrhea and syphilis. He was admitted to the hospital in the early part of March, 1904, and stated that his bladder symptoms dated back three months. He was at first unable to completely empty his bladder, and finally developed retention, so that it had to be drawn off with a catheter. He urinated about three or four times during the day, and the same number of times at night. When Dr. Meyer first saw him, a soft rubber catheter could pass without any special trouble, 150 c.c. of urine were passed, the residual urine amounted to 25 c.c. Rectal examination revealed an irregular, nodulated mass, which was so different from the usual forms of prostatic hypertrophy that, together with the cachexia and the short history, it raised the suspicion of malignancy. The cystoscopic picture also differed from the usual one of prostatic hypertrophy. The trabeculæ of the bladder wall, and the groove at the internal urethral orifice that were so characteristic of prostatic hypertrophy, were absent.

The patient was operated on May 21 of the pres-

ent year. Anterior to the bladder multiple glandular enlargements were found encroaching upon the bladder wall. After having opened the bladder, it was comparatively easy to introduce the fingers between the tumor and the rectum, and to remove the entire growth without injury to the latter organ. There was scarcely any hemorrhage. The infiltrated glands had invaded the bladder-wall to such an extent that permanent, water-tight drainage could not be instituted. The operation relieved the patient of the distressing constipation resulting from the pressure of the tumor. Death occurred in about seven weeks from pyelonephritis. Cancer of the prostate, Dr. Meyer said, was not a very rare condition, and probably often began within a benign adenoma. He emphasized the importance of early operative interference in these cases, before the growth had passed beyond the capsule. In later stages watertight suprapubic drainage, according to the Kaver-Gibson method, were the only means to ameliorate the patient's condition by a cutting operation.

Specimen of Chylous Hydrocele Fluid.—This was shown by Dr. F. Tilden Brown. The patient from whom this had been obtained was a man fifty-seven years old, a native of the West Indies, who had lived in New York for thirty years. Eighteen months ago a small stone had been removed from his bladder by litholapaxy. Following that operation, the patient complained of some pain in the left testicle, and subsequently it was noticed that the tunica vaginalis was gradually becoming distended. As there was some suspicion of syphilis—although the patient had never been treated for that disease—he was placed on potassium iodide in increasing doses. The treatment was continued for some time, but it had no effect on the scrotal tumor. The condition was then regarded as an epididymitis secondary to posturethral trauma, associated with a moderate hydrocele. An incision was made over the swelling, and upon introducing a trocar, pure milky fluid was withdrawn. Culture tests with this fluid had proven negative, and an examination of the patient's midnight blood had failed to show any *Filaria*. Under the microscope the fluid showed nothing but chyle. Dr. Brown asked to be informed if there was any other recognized cause for this condition beside the lymph vessel obstruction by the adult *Filaria Bancroftii*.

Dr. Fuller referred to a case in which a great many *Filaria* were found in the milky fluid.

The F. Tilden Brown Small-Sized Ureter-Cystoscope.—Dr. Brown also showed a No. 20 French ureter-cystoscope that he had had made specially for a child in whom it was necessary to catherize both ureters. It was made on the same line as his No. 24 French double ureter-cystoscope, but the smaller instrument took only the finest ureter catheters.

The Cystoscope as an Aid in Genito-Urinary Surgery.—By Dr. Follen Cabot. (Will appear in a subsequent issue of the MEDICAL NEWS.

Dr. F. M. Johnson, of Boston, Mass., said that the careful preparation of the patient, preliminary to cystoscopy, was of the utmost importance. He also advised testing the caliber of the urethra by the passage of a suitable sound before introducing the cystoscope. In order to illustrate the value of ureter-cystoscopy from a clinical standpoint, Dr. Johnson reported the case of a man who for four years had complained of almost constant pain in the region of the right kidney, from which he had been unable to get any relief, save through morphine. An examination of the urine showed that the case was apparently one of chronic catarrhal pyelonephritis, and upon introducing the cystoscope, clear, light-amber urine could be seen flowing from the orifice of the left ureter, while that from the opposite ureter was of a milky whiteness. The right ureter was catheterized, and the infected kidney treated by lavage. After four such treatments, the improvement was very marked. Microscopical findings in urine from right kidney showed a chronic nephritis probably of suppurative character. Another interesting case was that of an old soldier who had what was pronounced to be chronic and incurable Bright's disease. He complained of headache, indigestion frequent micturition and, at times, inability to walk. He had a stricture of the urethra, which was dilated; then both ureters were catheterized, and from an examination of the urine a diagnosis of chronic croupous nephritis was made. The treatment consisted of lavage of the ureters and bladder, and under this he improved rapidly. He gained ten or twelve pounds in weight, and while he was not cured, his more distressing symptoms had disappeared and he was able to return to work. Catherization and lavage of the ureters, Dr. Johnson said, if done slowly and gently, was devoid of much danger. The therapeutic value of this method, while still open to question, was well worthy of careful investigation and trial. He thought it advisable that the withdrawal of the catheter from the ureter should be accompanied by the introduction of a simple antiseptic remedial agent. In cases of chronic catarrhal pyelitis or catarrhal pyelonephritis from the irritation of an excess of urinary salts lavage of the ureters seemed to be very beneficial as an adjuvant to internal remedies. Dr. Johnson emphasized the importance of employing strict surgical precautions in doing uretercystoscopy. He had not found it necessary to use cocaine in the urethra, as gentle manipulation obviated its use. In the bladder, however, he preferred to use a one per cent. solution of cocaine, as the organ was then better able to retain the water that was put in before the operation was undertaken. Injections made into the kidney itself should be of about the same temperature as that of normal urine.

Dr. Fuller, in the discussion, said that while there was no doubt about the value of cystoscopy, some genito-urinary surgeons seemed to resort to the procedure as too much a matter of routine, while others neglected it too much. The preparation of the patient for the operation was very valuable, as the procedure became much simpler in a case where there was no tenesmus or straining, and where the urethra had become more tolerant. It was not always possible, however, to give much preliminary treatment, as many of these cases came from out of town and did not have much time. Dr. Fuller said he did not feel competent to express an opinion as to the value of medicating the pelvis of the kidney by means of catheterization of the ureters. As Dr. Johnson had said, however, the field was certainly worth investigating.

Dr. Frederic Bierhoff, in the discussion, said that while preliminary treatment for cystoscopy was not an absolute necessity, it was advisable in all cases in which it was possible to resort to it. By thorough disinfection of the parts, flushing of the bladder, and care in the use of instruments the chance of inflam-

matory reaction was greatly diminished, particularly if these patients would immediately take a hot sitz-bath on reaching home, and then go to bed. The use of moderate doses of quinine and urotropin still further diminished the tendency to reaction. One of the most important precautions was to thoroughly cleanse the cavity of the bladder and not introduce the cystoscope until the fluid returned absolutely clear. This procedure might in some cases take half an hour and prove very tedious, but the operator would be rewarded by the clearness of the picture he finally obtained. The quantity of fluid necessary to fill the bladder varied greatly between the male and the female bladder. The female bladder had a much greater capacity than that of the male, and in some cases it was necessary to inject as much as 450 or 500 c.c. of fluid. In the male, from 150 to 250 c.c. would usually be sufficient to distend the bladder and render all parts of it accessible. Too little attention, Dr. Bierhoff said, was usually paid to the light. He had never been able to adopt the so-called cold lamps, particularly in those cases where the bladder was filled with fluid. While this light looked bright enough outside the bladder, or in a bladder filled with air, it did not possess sufficient penetrative power in a bladder filled with fluid. The more brilliant the light the better were the chances to make a complete and satisfactory examination.

Dr. Bierhoff said that one of the more obscure but not infrequent conditions which we were able to recognize with the cystoscope was the bladder of tabetics. These bladders sometimes held a surprisingly large amount of residual urine. The speaker said he had seen the amount run up to 1,500 c.c. in a tabetic patient—after an attempt had been made by the patient to empty his bladder voluntarily—and this without any stricture or other cause. In some of these cases a well-marked trabecular bladder will be found, together with great dilatation, and the only explanation for this will be the spasmodic contraction of the compressor muscle. In all these cases of tabetic bladder, the cystitis was usually the first symptom that called the patient's attention to the bladder, and unless the physician kept this condition in mind, he was apt to be led astray. There were also numerous cases of bladder contraction which would escape recognition without the use of the cystoscope. The speaker said he recently reported a case of that kind in which marked vesical contraction occurred following the extension of a suppurative process from the testis to the cord and perforation of the abscess. The cystoscope was also of value in obscure cases of perirenal suppuration, in which there was a discharge of pus through the ureter.

Dr. F. Tilden Brown said he could substantiate Dr. Bierhoff's statement in regard to the presence of trabeculæ of the bladder independent of appreciable obstruction in the way of prostatic overgrowth or urethral stricture. The practice of using a large amount of fluid in the bladder, particularly the female bladder, was often a detriment rather than an advantage, because the bladder has a tendency when overweighted to fall backward and sag downward—pouching into the vagina. When this occurs the trigonum is in part or wholly below the level of the internal meatus, and then the ureters are quite inaccessible for catheterization. Dr. Brown said that the value of leaving the ureteral catheters in the ureters must be exceptional, and there were many disadvantages connected with such a procedure. The ureteral epithelium was very delicate and easily detached, and unless the greatest gentleness was exercised, the manipulations would give rise to more or less bleeding, and whether this is micro- or macroscopic a correct interpretation of the returns may be jeopardized. It was his practice to use short catheters in nearly all cases and pass them only 2½ inches, and to retain the cystoscope quietly in place while the eight to ten cubic centimeters collection of urine from each side was being caught.

Dr. Willy Meyer said he simply wished to emphasize the fact that the cystoscope had literally carried a bright light into the hitherto dark field of urinary surgery.

Dr. Winfield Ayres said that the true value of ureter-cystoscopy in its relation to the treatment of diseases of the kidney was still unknown, and opened a large field for investigation. If a catheter was left in an inflamed ureter for only fifteen or twenty minutes, it was apt to excite bleeding. In such a case the speaker said he would make his applications to the kidney as rapidly as possible, and then withdraw the catheter.

Dr. William K. Otis, in the discussion, said that the question of catheterization of the ureters had overshadowed the purpose for which the cystoscope was originally devised, viz., that of examination of the bladder. As a matter of fact, the instrument used for catheterization of the ureters was not suitable for examining the bladder, there being a strong tendency to diminish the caliber of the instrument at the expense of the optical apparatus, thus giving a small and badly illuminated field. The fundamental requisites for a good cystoscope being as large lenses as possible and as large a lamp as possible in order to give a clear, large and well illuminated picture. He himself was in the habit of employing cystoscopes of various sizes, using the largest possible in a given urethra, even as large as No. 30 F., thus obtaining a much clearer and more definite field than with the ordinary cystoscopes. As had been remarked by Dr. Bierhoff, as a preliminary measure to a successful cystoscopic examination it is exceedingly important to thoroughly cleanse the bladder, and the use of distilled water was preferable to ordinary sterilized water on account of the increased clearness of the medium.

Dr. A. V. Moschcowitz called attention to the value of uretercystoscopy in connection with cryoscopy. The freezing point of the urine from each ureter, as compared with the freezing point of the blood, would help to determine the functional capacity of the kidneys.

Drainage of a Prostatic Abscess Through the Ischiorectal Fossa.—Dr. F. Tilden Brown, in the discussion on Dr. W. C. Lusk's paper, said that his experience with prostatic abscess was comparatively limited. He could only recall four or five cases, and in two of these the abscess had pursued the course which was not infrequently met with, namely, that of burrowing along the ischiorectal fossa and presenting besides the anus. The method of approaching these abscesses suggested by Dr. Lusk was a safe and comparatively easy one, and would obviate the possibility of rupture into the rectum or urethra. In some cases a urethral opening would perhaps be simpler and better.

Dr. Winfield Ayres said he had never yet met with a prostatic abscess that required opening; it had always ruptured spontaneously before he thought

it required opening. He recalled three cases that opened into the prostatic urethra, and in those the cure was exceedingly slow. In one of them three years had elapsed, and the cure was not yet complete. The other two persisted nine months or so. In one case the abscess ruptured into the rectum, and a cure was effected in less than a month. The only objection to the method proposed by Dr. Lusk was that the diagnosis was not always easy. If you made the diagnosis of an abscess deeply seated in the prostate and not close to the urethra, then it was safe to go in and open it; if, on the other hand, you made a mistake, and the abscess was located near the urethra, the relaxation of the pressure that would follow its incision would be apt to be followed by sloughing and the formation of an obstinate urethral fistula.

Dr. Edward L. Keyes, Jr., said he could only recall four cases of prostatic abscess, all dissimilar in character. In one there was a history of vesical suppuration, and a perineal section disclosed an old abscess cavity. In the second case there were several suppurating foci in the prostate, and in such a case, Dr. Keyes said, he did not think that the lateral incision suggested by Dr. Lusk would meet the requirements. This patient had an abscess pointing distinctly toward the rectum, and it was opened in that way. In this case there were two additional foci in the opposite side of the prostate, both of which opened into the urethra. This patient made a rapid recovery. The third case developed a prostatic abscess after an operation for vesical calculus. It opened into the rectum and the patient made a good recovery. In the fourth case there was a large abscess pointing toward the rectum. In opening this a perforation of the bladder wall occurred. The vesicorectal fistula closed spontaneously in six weeks without any further serious complications.

Dr. Francis Cruger Edgerton said that some months ago a man came into the Hudson Street Dispensary suffering from retention of urine. A catheter was passed, which caused a prostatic abscess to rupture into the urethra. Two or three days later he had a second attack of retention, and catheterization was again followed by rupture of the abscess. The retention again occurred, and he was finally sent to Bellevue, where the abscess ruptured for a third time. On the following day, Dr. Edgerton did a perineal section, and enlarged the opening into the urethra. The speaker said that in many of the cases he had seen, rupture into the urethra had occurred before the patients came under observation. If the method of dissection proposed by Dr. Lusk would be followed in those cases, it would be apt to result in a urethro-perineal fistula.

Dr. James Pedersen said that though the subject of prostatic abscess was generally regarded as one of minor importance, it involved many interesting points. Chief among these, he thought, was the difficulty in making a diagnosis, and therefore in deciding when to operate. He recalled four cases in which the presence of an abscess suddenly became apparent, though its presence had scarcely been suspected. On the other hand, he recalled two cases in which a well-marked abscess pointing toward the perineum had ruptured into the urethra while preparations for operation were being made. Both of these cases recovered without any complications.

BRITISH MEDICAL ASSOCIATION.

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SECTION ON PSYCHOLOGICAL MEDICINE.

(Continued from Page 912.)

Criminal Responsibility.—This was the title of an address by Dr. Charles Mercier, of London. On this subject he said there has been a difference of very long standing between the professions of law and medicine, a difference which he was sanguine enough to believe may be reconciled. The difference of opinion is largely due to the difference of aim, and there is little prospect of agreement until the object in view shall be the same for both parties to the dispute. It will be admitted that the legal mind approaches the question of criminal responsibility mainly and primarily with the object of protecting the community from wrongdoers; while the medical mind is apt to regard primarily, and perhaps too exclusively, the individual offender, and the justice or hardship of the punishment that is inflicted on him, and to strive for the mitigation of punishment in individual cases in which the law seems to bear with undue hardship on the criminal. The first thing to be done in order to reconcile the opponents is to show that these two objects are not necessarily antagonistic, but rather that they are two aspects of the same problem; that neither can be attained without the attainment of the other, that the complete solution of the problem would secure the attainment of both, and that the one suffers as much as the other from a faulty law, or from the faulty administration of a good law.

Moreover, he ventured to suggest that neither the protection of the community from wrong-doers, nor the protection of individual wrongdoers from excessive punishment, is the highest or the ultimate aim in dealing with criminals. Both of these, it seemed to him, are subsidiary to the attainment of a still more desirable end—the strengthening of the sense of responsibility throughout the whole community. This sense of responsibility suffers as much from an unduly severe as from an unduly negligent infliction of punishment. "Let us seek," he said, by way of illustration, "means by which we can so corrupt the conscience and debauch the mind of the man of passion who is trembling on the brink of crime, or of the man of feeble will who is tempted by circumstance, that he may deliberately cast the fear of punishment behind him, and say with eager choice, Evil! be thou my good! Could not we do so most effectually by addressing him thus? By saying to him, 'You are not as other men are. You belong to a separate class of human beings. You are marked off from the rest of your race from your birth, and are devoted and predestined to a life of crime. You are incapable of regulating your life according to the canons of rectitude: they do not apply to you. Your skull is oxycephalic; it is unsymmetrical; its frontal curve is less, and its parietal curve is greater than those of other men. Your forehead recedes; or, worse, it projects. Your chin projects; or, worse, it recedes. You have no wisdom teeth. Your ears are too large; they are too small; they are misshapen. Your hair is thick; your beard is thin. You are dark in complexion. You are unusually fair. You have a fixed look in your eye; you have a glassy stare; you look like a bird of prey; you have a singular air of *bonhomie*, you have an

angel face; you have the appearance of a wild beast; and the glance of a tiger; you have a peculiarly benevolent aspect. In addition to these stigmata, which mark you as a born criminal, you are shorter than the average; you are taller than most men. Moreover, you have tatoo marks on your arms, and perhaps on your body also. This being so, we regard you as irresponsible. You are a criminal, it is true; but the fault is not yours. It is not in the habit you have formed of yielding to your passions. It is not in your self-indulgence; your laziness; your slavery to impulse; your selfishness; your cultivated lack of self-control. No! It is impressed upon you by your inheritance. You, poor fellow, are visited with the sins of your father and grandfather, even unto the third and fourth generation of ancestry. You are a thief, a murderer, a violator, it is true; but this is not your fault. You are a criminal, as Falstaff was a coward, by instinct. In one word, you are a degenerate, and, since your crimes are no fault of yours, you shall not be punished for them. On the contrary, you shall be entertained, amused and instructed. You shall be treated with Turkish baths and massage, until your criminality departs from you. You shall exercise in a gymnasium, to the strains of a band of music, played by your fellow criminals. You are of weak mind; and therefore you shall be aesthetically cultured by a course of lectures on Chaucer, and Shakespeare, and Emerson, and Browning. You are a semi-imbecile; and therefore you shall be put through a course of Jowett's Plato. As a means of elevating your character, you shall be taught—journalism; and be provided with a newspaper to edit, whose contributors and readers shall be your fellow prisoners.'"

No, gentlemen, these are not the ravings of Bedlam; these are the teachings of the writers who call themselves criminologists, translated, out of a somewhat exuberant verbosity, into naked English.

Luxury for Criminals—Who Pays For It?—He then called the attention to the fact that these luxuries, by which the wicked man is to be turned away from his wickedness that he has committed, and made to do that which is lawful and right, do not grow spontaneously out of the ground; nor do they fall, like manna, from heaven. They are provided, for the use and delight of the criminal, by the thrift, the labor, the self-denial, of law-abiding men. If criminals and scoundrels of every order are to be thus pampered and coddled, what is to be done for the upright man, for the honest, self-restrained, law-abiding citizen, who sees, at the end of a lifetime of ill-rewarded toil and privation, borne with uncomplaining fortitude, no resting-place for his old age more luxurious than the workhouse—that workhouse which is scorned and derided by the occupants of these comfortable gaols. If the luxury of an Elmira, for instance, is not too good for the criminal, what degree of the splendor is good enough for the honest poor man, who, in the teeth of penury, has preserved his integrity? Even granting all that the fanatics of criminal pampering claim for the result of their methods—even granting that a certain small proportion of scoundrels may, by a course of Turkish baths, the lectures on English literature, and the study of Plato, be weaned, for a time at least, from a career of crime—is the game worth the candle? Is it fair, is it just to the taxpayer, often a poor man, and sometimes an honest man, that many hundreds, or it may be thousands of pounds of public money should be spent in turning a few criminals into indifferent citizens? There is joy in heaven, we are told, over one sinner that repenteth; but if the repentance were not to be secured save by an increase in the celestial income tax, it is fair to suppose that the joy would be but a mitigated and chastened felicity. But, apart from the unfairness of such a mode of treating the criminal, an even more important consequence of this doctrine of innate criminality, upon which the practice is founded, is the weakening of that sense of responsibility which it should be the aim of every system of criminal law to foster and strengthen. What will be the natural result of teaching an evildoer that his wickedness is the fault, not of his own vice, self-indulgence, dissipation and facility to temptation, but of the organization that he inherits from his ancestry? Will it not certainly be, that he will relinquish any struggles toward a better life that he may have begun, and will complacently pursue that course of crime that he is told is, for him, inevitable? A more pernicious and immoral doctrine it is difficult to imagine. For his part, he abhors and repudiates the doctrine with vehemence. Crime, as his friend Dr. Urquhart has said of drunkenness, is not a disease to be treated, but a vice to be punished. The more is it incumbent on us to see that the punishment is prompt, is certain, is apt, is adequate, and no more than adequate, to the offence. Of these elements in punishment, the majority must be left in other hands than ours. For its promptness, its certainty, its appropriateness, we must be content to trust the police, the judge and the prison authorities. The main question that we have come here to-day to discuss is, Who ought to be punished, and with how much punishment?

To the first question the answer—Wrongdoers, by which is meant, those who for their own gratification, and without justifying provocation, wilfully do harm to others. The whole gist of his argument lay in this definition; which has this advantage, that if it be accepted, it excludes from wrongness certain cases of doing harm, and provides the same criterion of responsibility, that is of liability to punishment, to both the sane and the insane.

Insanity and Responsibility.—Insanity may exonerate from punishment the man who injures another, but only by enabling him to satisfy the same condition that exonerates a sane person. In the insane as in the sane, the responsibility for guilt lies in the *animus nocendi*, or *scelerandi*. When their lordships said that "to establish a defence on the ground of insanity, it must be plearly proved that . . . the accused party was laboring under such a defect of reason . . . as not to know the nature and quality of the act he was doing," they were but saying that if from want of knowledge the *animus nocendi* was absent, the plea was established. It is true that their answer was not the general answer, that the *animus nocendi* is essential to guilt; but the particular answer, that, when this *animus* was absent from a particular cause, the prisoner is not guilty; but then it ought always to be remembered, though it never is remembered, that the judges were not asked the general question, "Under what circumstances does insanity in a criminal exonerate him from punishment," but the very restricted question, "What are the proper question to be submitted to the jury when a person afflicted with insane delusion respecting one or more subjects or persons is charged with the commission of crime, and insanity is set up as a defence?" The contention of his address was that the judges were right; that the *animus nocendi* is

essential to guilt, and that the constituents of this *animus* are contained in the definition: First, harm done, with no intention of obtaining gratification by the doing, is not wrong, and is not punishable. The difference between the salutary wound inflicted by the surgeon, and the malicious wound inflicted by the assassin, is in the respective intention of the actors, not in the consent or non-consent of the sufferer, nor in the result of the wounding. The surgeon may act without the consent of his patient, who may be unconscious from that fracture of the skull which the operator is about to trephine; yet the trephining is not wrong. Or the surgeon may do harm instead of good, and unwittingly hasten instead of retarding the fatal result of disease; still his act is not wrong, for he did not do the harm for his own gratification. But if he did the operation merely to display his skill, or to obtain practice in his art, he does wrong, even though by his operation he cures the patient. It matters not whether the intention is sane or insane; whether the skilled surgeon opens the cranium to excise a tumor, or whether a blundering madman splits the skull open to let out a headache; so long as there is no intention to gain gratification for himself by harming another, no wrong is done. Secondly, provocation or threat justifies retaliation in measure—in such measure as will prevent the threatened injury. One may stun, maim or even kill, him who is, in his firm and settled belief, about to kill him; and one's exoneration is complete, whether his belief is just and true; or whether it is a sane mistake; or whether it is an insane delusion. In either case, the *animus nocendi* is wanting. Thirdly, the harm must be done wilfully, or there is no wrong done, and therefore no wrongdoer to be punished. The law allows the principle. A prisoner is indicted, not for murder *simpliciter*, but for wilful murder. Wilful action implies and requires knowledge of the nature of the act, and of its obvious and natural consequences; and, further, implies and requires volition,—intention to do the act, and to cause, by so doing, the said consequences. If either the knowledge or the will is wanting, the act is not wilful; it is not wrong; it is not punishable.

Irresistible Impulses.—In his opinion, the doctrine of uncontrollable impulses has been invented to cover those cases in which crimes have been committed by persons who are plainly insane, but who cannot reasonably be said not to know the nature and quality and wrongness of their act; and the one doctrine has had to be stretched and distorted as much as the other in order to bring about the desired result. What has been intended when irresistible impulse has been pleaded, was not really irresistible impulse, but absence of will to do the deed—absence of that *animus nocendi* which is necessary to wrongdoing. Irresistible impulse, in the technical sense of a sudden outburst of maniacal violence, so rarely comes within the purview of a court of law, that, with a pretty extensive acquaintance with the subject, he was unable to cite a single case. The only case in which irresistible coercion of the will can properly be pleaded, is the case of obsession; and in this case, the act is not necessarily impulsive in the technical sense, although it must be regarded as irresistible. Obsession is a terrible malady. It is rightly regarded with suspicion and distrust by jurists, anxious to maintain the standard of individual responsibility; but of its existence there is not a shadow of a doubt, and in any given case, this existence is to be proved to the satisfaction of the Court by evidence given according to the ordinary rules. Doctors practising in insanity are, not seldom, consulted by persons, who complain, with the greatest distress, that they feel a horrible impulsion to do some act which is utterly abhorrent to them; to set fire, it may be, to their own property; to kill, it may be themselves, it may be those dearest to them. Against this impulsion they struggle with dismay and with horror. Sometimes they overcome it, and it fades away. Often they place themselves voluntarily under control in asylums to keep themselves out of temptation. Occasionally they apply to the police to be forcibly restrained. Sometimes they succumb, and the deed is done. In this last case, should they be punished? Such cases rarely, however, occur in criminal courts. Much more frequent are cases of another kind, in which, while knowledge of the wrongness of the act is present, the *animus nocendi* is absent, from want of will to do harm. For how many generations has the act of Virginius, in killing his daughter to save her from a fate worse than death, been applauded by the moral sense of mankind? How many times has it not been emulated by officers of our own army, whose womenfolk have been on the point of falling into the hands of savage foes? Cases in which children are killed by their parents, wives by their husbands, on a motive similar in character but insane, are very frequent in our courts. It was in such a case that that great judge, Lord Blackburn, finding that the prisoner could not be exonerated on the ground of not knowing that her act was wrong, told the jury that there were exceptional cases; a doctrine scarcely satisfactory if such cases were rare; but surely to be deprecated when they are very frequent. The application of the rule, that the *animus nocendi* is essential to guilt, would render it unnecessary to treat such cases as exceptional. The will and intention of the actors is, not to harm the victims, but to do them good. They are killed in order that they may be benefited. Of alternative evils, believed to threaten them, the less is chosen for them; and, the *animus nocendi* being absent, the actor, whether sane or insane, should not be punished.

The advantages of the course which he advocated, he said, were many. It introduces no new principle of law; it demands no legislation; it needs no definition of insanity; it does not disturb the famous answers of the judges; and it can be applied to every case, without stretching the principle, without straining or distorting the plain meaning of the language in which it is expressed. All that is needed is that the charge in the indictment should be proved or not proved; that when a prisoner is charged with wilful wrongdoing, he shall not be punished if the wrongdoing was not wilful.

The Legal Point of View.—Sir Herbert Stephen Burt said that, having read the abstract of Dr. Mercier's paper, he found himself in almost complete agreement with it. In illustration of what he, as a lawyer concerned in the administration of criminal law, conceived to be the principles there enunciated, he offered the following observations: I. The question whether or not there existed what was called a "criminal neurosis"—by which phrase he understood a set of peculiarities of bodily construction, which in concurrence were always or generally accompanied by a strong disposition to commit crimes—was a question not of law, but of medicine. All he had to say upon it was: (1) That, following the opinions he had heard expressed by Dr. Maudesley and Dr.

Mercier, he did not believe it existed; (2) that if its existence were, in his judgment, proved, or decidedly probable, he should allow medical evidence to be given that a person accused of crime had a criminal neurosis, and should advise juries that this was evidence (strong or otherwise, according to circumstances) tending to prove the accused person to be guilty; (3) he should further regard the condition of criminal neurosis in convicted criminals as a reason for depriving them of their liberty to commit crimes for as long a period as seemed convenient, subject to their treatment being as little injurious to them as was consistent with public policy.

II. He believed that the point which it was essential to understand for the proper legal treatment of insane persons who committed crimes was that some criminals who were insane should nevertheless be treated as criminals—though it might frequently, or even usually, happen that their insanity should be considered a reason for mitigating the severity of their punishment. In explanation of this belief he offered a few remarks concerning cases of crime committed by persons suffering from insanity of different kinds, which ought to have—and in English law substantially did—lead to different results.

A. A case of which he had to do with several examples was that where a person suffering from some disease classed as epilepsy killed some one, generally a friend or lover, often in the presence of several persons, and almost always by cutting the throat. In these cases is appeared probable, as far as could be discovered, that the epileptic had no subsequent memory of the act of killing, or, in a minority of the cases, had only a faint and clouded memory like the memory of a dream. In these cases it seemed clear that only physical restraint (and probably very strong physical restraint) at the critical moment of the seizure would have prevented the killing; also that the act was unaccompanied by anything that could properly be called consciousness. It appears to him that those who did these more or less unconscious acts ought not to be punished therefor, but ought to be regarded as unfortunate instruments in a misfortune, as a man would usually be regarded who accidentally killed another by convulsive movements caused by a nightmare or a fit of delirium. He thought they ought to be treated merely medically, and should suffer no more restraint than was necessary as a precaution against a recurrence of the epileptic attack.

B. An example of a different class of acts of insane persons occurred in the constantly-recurring case where a woman—generally soon after pregnancy—killed her own child, oftener by drowning than in any other manner, but also not infrequently by cutting. In these cases, as well as could be discovered, she knew that she was killing the child, and meant to kill it, and did so because, being passionately fond of it, she had an obsession of mind sufficiently abnormal to be called insane, to the effect that death was highly desirable for the child. In these cases, as a rule, the woman could, when the mental obsession had passed off, remember what she had done, and deeply regretted having done it, but remembered also the thoughts which made her do it. He did not consider mere punishment suitable for such cases as these, but he thought there should, in any event, and irrespectively of the health of the sufferer, be a considerable period of enforced seclusion and submission to some form of discipline, because although the patient's knowledge of what she was doing, and of its general nature, was entirely overcome for the moment by the violence of her mental obsession it was never entirely suspended as in the cases in Class A. He judged this kind of mental obsession to be a thing against which the sufferer could and ought to have struggled, though the struggle in many cases might prove ineffective.

C. A third sort of case which came before the criminal courts rather less frequently than the two he had discussed was where the insane affection of the mind was a much more remote cause of the crime. Again, he took homicide as an example, because it was almost always in cases of homicide—and generally of murder—that these questions arise. In this class of case the patient, in consequence of a morbid affection of the mind, conceived a violent hostility towards some person who might be reasonably deserving of hostility to a considerable extent, or to a moderate extent, or not at all. The insane man, then, in gratification of his hostility, proceeded to murder his victim, employing for that purpose all the intellectual resources of the sane. He showed premeditation, care, resolution, and skill in arranging for his own escape. There was no reason to doubt that he knew as well as possible that he was committing murder, that murder was sinful, and a crime, and that he might be punished if he were caught. His immediate motive was hatred, and cruelty and treachery were probably features in his action, just as if he had been sane. The actual existence of all the provocation that he might conceive himself to have had would not in the least have affected either the immorality or the illegality of his act. He thought that insane criminals belonging to this class ought to be punished. He would treat them not as invalids unfortunately concerned in crime, but as criminals who happened to be suffering from a disease, which might or might not be a reason for mitigating the severity of their punishment. In some cases—though not very many—he thought the full penalty for the offence should follow the conviction, exactly as if the offender were perfectly sane. In others, where the extent of morbid delusion and insane behavior appeared to be comparatively great, he thought that conviction for crime should follow the offence, but that the punishment should be mitigated. He included in this class the cases where mental disorder amounting to insanity was the originating cause of criminal indulgence of the sexual passion, whether the resulting crime was murder or rape. He could not recall a case of an insane person tried for a crime of this character in which it did not appear that he knew perfectly well what he was about. He was inclined to think, after twenty-years' experience of the administration of criminal justice in England, that the above category of criminal acts committed by insane persons was practically exhaustive.

(To be Continued.)

BOOKS RECEIVED.

TEXT-BOOK OF NERVOUS DISEASES AND PSYCHIATRY. By Dr. Chas. L. Dana. Sixth Edition. 8vo, 690 pages. Illustrated. Wm. Wood & Co., New York.

REFRACTION AND HOW TO REFRACT. By Dr. Jas. Thorington. Third Edition. 12mo, 314 pages. Illustrated. P. Blakiston's Son & Co., Philadelphia.

A TREATISE ON OBSTETRICS. By Dr. E. P. Davis. Second Edition. 8vo, 809 pages. Illustrated. Lea Brothers & Company, Philadelphia and New York.